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CPSU/UH Avian History Report 12 A B C **(D)**
HISTORY of ENDEMIC HAWAIIAN BIRDS

Part I. POPULATION HISTORIES--SPECIES ACCOUNTS
Freshwater Birds: Hawaiian Stilt Ae'o

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May 1988

UNIVERSITY OF HAWAII AT MANOA

NATIONAL PARK SERVICE contract No. CX 8000 8 0012

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ABSTRACT

Himantopus mexicanus knudseni is a slim, medium-sized black and white wading bird with long black bill and red legs. It is resident on five islands - Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i, and on Ni'ihau after seasonal winter rains. Exhaustive search of literature and government reports uncovered some 5,429 observational notes, collection records, census reports and related statements on relative abundance and geographical distribution from 1870 to 1983. Data are serially numbered, arranged in geographical and chronological order, referenced and systematically reviewed.

Analysis of census records in recent years indicates a total pre-breeding population of about 900 of these birds distributed as follows among the various islands: Kaua'i, 144 (16%); Ni'ihau, 135 (15%); O'ahu 324 (36%); Moloka'i 9 (1%); Maui, 261 (29%); and Hawai'i, 18(2%). recent post-breeding populations averaging 1,100 individuals were found to be distributed as follows: Kaua'i 286 (26%); Ni'ihau, 44 (4%); O'ahu 495 (45%); Moloka'i, 22 (2%); Maui, 242 (22%); and Hawai'i, 22 (2%). It is postulated that mortality factors and annual average production of about 200 young results in a population turnover every 5 years. The total population is judged to be relatively stable long-term.

4. Himantopus mexicanus knudseni

Ae'o o Hawaiian (Black-necked) Stilt

Himantopus mexicanus knudseni is a slim, medium-sized (14-17 inch long) wading bird (Recurvirostridae), black above and white below, having a long thin black bill and long red legs (Peterson 1961). It differs chiefly from its nearest relative, the Black-necked Stilt of North America (Himantopus mexicanus mexicanus), by having a longer bill, a generally much more restricted amount of white on the forehead, retrices (except the central pair) broadly tipped with greenish, and the longer upper tail-coverts much mixed with black (Rothschild 1900). Coleman (1981 PhD thesis) also found the Ae'o to be significantly larger than H. m. mexicanus.

The Ae'o is found on Kaua'i, Ni'ihau, O'ahu, Moloka'i, Maui and Hawai'i where numbers fluctuate due to inter-island movements. It was recognized as being a rare species by Hawaii State Division of Fish and Game in 1969.

The Ae'o was described in 1888 by L. Stejneger (1988) from specimens collected on Kaua'i by V. Knudsen, presumably in 1887 (106). H. C. Palmer, G. C. Munro, A. Seale, and Prof. Collett obtained a combined total of 11 additional specimens on Kaua'i from 1891 to 1900 (Banko 1979 report) (107-110).

Distribution of 29 of the 55 known specimens among some 14 repositories is as follows: American Museum of Natural History (16), Bernice Pauahi Bishop Museum (8, incl. 1 egg), and British Museum of Natural History (5) (Banko 1979 report).

Wilson and Evans (1893), Rothschild (1900), Henshaw (1902), and Perkins (1903) include the Ae'o in their early monographic treatments of Hawaiian birds. Schwartz and Schwartz (1949) furnished information on the status and distribution of this bird a half-century later. Berger (1972) combined information from these and other sources in a contemporary summary account; however, the largest store of recent information on the Ae'o is that contained in unpublished reports of the Hawaii State Division of Fish and Game (now Forestry and Wildlife) and U. S. Fish and Wildlife Service. The writer wishes to thank R.J. Shallenberger (USFWS) and M. Morin (HDFG) for supplying information and commentary helpful in interpretation of agency census records.

OBSERVATIONS, REPORTS AND SPECIMEN RECORDS

Introduction

Drawing conclusions from a large volume of historical information on relative abundance and distribution of Ae'o required that data be geographically arranged and chronologically ordered in a systematic fashion, as outlined in the Introduction to Part I (CPSU/UH Avian History Report 4). Records presented in the Appendix satisfy criteria for basic documentation and comparative analysis.

In the following descriptive account, sources of published information are cited by author and year in the usual style. One, two, or three digit numbers in parenthesis refer to specific information listed in the Appendix. Sources of published and unpublished information listed in the Appendix may be traced to complete references in the bibliography.

Historical Status and Distribution in the Archipelago

As indicated in the Appendix (No's. 1-48) there are some 48 records related to the status and distribution of Ae'o in the Islands from 1879 to 1981. Most authors before 1950 point out the common to abundant status and broad distribution of this species over five islands of the Archipelago. Records since 1950 are comprised largely of periodic counts by the Hawaii State Division of Fish and Game, the U.S. Fish and Wildlife Service, and since about 1965 observations of Hawaii Audubon Society members.

Hawaii State Division of Fish and Game personnel and various cooperators began censusing water birds, including Ae'o, a decade after the initial survey by the Schwartzes in 1946 and 1947. The purpose and methodology employed in the counting of this species by HDFG biologists has varied considerably over the years. From 1956 to 1967 Ae'o seem to have been systematically recorded Statewide only during the general January census of all waterbirds. A summer count of Ae'o was initiated in 1968. Censuses of increasing frequency and intensity have been carried out since about 1972.

The data presented in Table 1, especially those representing progressively earlier years before 1972, are thus not exactly of equal value, or in some cases hardly even comparable to those obtained later (12-25, 27, 28, 30, 31, 33-35, 41-48). It is believed, however, that the comprehensive semi-annual censuses beginning in 1977 are relatively indicative of actual population levels (36). The last published population estimate of 1,100 was probably supplied from a recent census by the Hawaii State Division of Fish and Game (Anon. 1982) (48a).

Casual overview of Ae'o census data in Table 1, tabulated from 1956 to 1981, reveals some obvious deficiencies. For

example, there were a number of years when no census at all was carried out (1958-1962, 1972, 1973, 1975), and other years when either the January or July/August count was omitted, or when coverage failed to include one or more islands (all years except 1977-1981). Besides these disparities only the counts tallied from 1976 to 1981 were conducted according to prescribed goals and methodology, leaving open to question what standards, if any governed censusing before 1976 when 14 of the 24 counts were carried out. To the above irregularities can be added the usual technical difficulties of gathering consistent data of high accuracy year after year, such as movement of flocks during the count (resulting in birds missed or counted twice), intra-island coverage efficiency, degree of repetitiveness, variable distribution of the population, etc. Nevertheless, despite the many known and unknown factors which affect the data in Table 1, certain patterns can be identified when results are compared.

To aid comparative evaluation of the 14 censuses conducted from 1956 to 1981, differences and percent change have been calculated for various groups of data and listed in Columns A-H in Table 2. Results of calculations are as follows:

1. Col. A = numerical differences between January censuses
2. Col. B = percent change (+ or -) in numerical differences between January censuses
3. Col. C = numerical differences between July/August censuses
4. Col. D = percent change (+ or -) in numerical differences between July/August censuses
5. Col. E = numerical difference between January and July/August censuses in any given year.
6. Col. F = percent change (+ or -) of the January population when counted again the next following July/August
7. Col. G = numerical difference between the July/August census and the January count the following year
8. Col. H = percent change (+ or -) of the July/August population when counted again the following January.

Analysis of data in Table 2 reveals that:

January Censuses

An average of 640 Ae'o were counted in 14 January censuses between 1956 and 1981. Ae'o counted per census ranged between 338 and 1,185. An average count of 480 was obtained for the first 9 years (1956-1969), while an average of 928 was

compiled for the alst 5 years (1977-1981), an increase of about 93%. Presumably some, if not all, of the increase an be attributed to greater censusing coverage and efficiency.

July/August Census

An averge of 1,197 Ae'o were counted in 14 January censuses between 1968 and 1981. Ae'o counted per census ranged between 934 and 1478. An average count of 1269 was obtained for the firest 6 years (1968-1976), while an average of 1088 was compiled for the last 4 years (1977-1981), a decrease of about 14%. The severe decline recorded from July/August 1976 to January 1977 (26%) may have reflected low breeding success due to a dry spring and summer, according to Hawaii State Division and Fish and Game reprotos for this period.

Differences Between Successive Years, January Censuses (Columns A & B)

Examination of January census results in Table 2 shows that maximum numerical differences in population size between successive years (Col. A) are moderagely large, ranging from -367 to +358, and exhibiting other similarly wide differences.

Population increases and decreases in successive years are remarkably uniform during the overall 1956 to 1981 period, there being six increases and five decreases reported. However, consecutiveness of increases or decreases in successive years changed between the initial reporting period (1956-1969), when increase and decrease alternated each year (with 1 exception), and the terminal period (1978-1981) when increases and decreases were reported for two years in succession without exception.

Data in Column B reflect the percent difference in population size exhibited in Col. A and is therefore a parallel indicator of change.

Symmetry of data in Col.'s A and B, revealing differences in January population size between successive years seems to be relatively high indicating counts are probably increasingly representative of reality.

Differences Between Successive Years, July/August Censuses (Columns C & D)

Examination of July/August census results in Table 2 shows that maximum numerical differences in population size between successive years (Col. C) are, like those in Col. A, also moderately large, ranging from -338 to +301 (vs. -367 to +358 in Col. A), and exhibiting other similarly wide differences.

Counts indicating population increases and decreases in successive years are not as uniform in Col. C as in Col. A (January counts), there being only 2 successive years of

July/August count showing increases and decreases and 4 years when increases and decreases alternated. However, consecutiveness of increases or decreases in successive years (1969-1974) and the terminal period (1977-1981), there being only one example in each period where decreases followed from one year to the next, and two examples where increases and decreases alternated between successive years.

Data in Co. D reflects the percent change in population size exhibited in Col. C and is therefore a parallel indicator of change. Overall, symmetry of data in Col.'s C and D, showing differences in July/August population size between successive years, seems reasonably uniform, leading to a conclusion that counts probably increasingly reflect actual population size.

Differences Between January and July/August Censuses (Columns E & F)

Col.'s E & F represent, in any given year, numerical and percent change of the January population level when censused again the following July/August. The largest single component of any increase between breeding and postbreeding seasons is, potentially, annual production.

Examination of the differences portrayed during the six years when comparisons are possible (Col. E) show wide ranging fluctuations, from an increase of 1096 (+263%) to a decline of 71 (-6%), the latter occurring during a notably dry spring and summer. Increases in July/August census results prevail over previous January counts in five of the six years, averaging 581 (+124%) annually. The average annual increase for the entire six year period is, however, only 472 (+102%).

Differences Between July/August and January Censuses (Columns G & H)

Col.'s G and H represent, in any given year, numerical and percent change of the July/August population level when censused again the following January. The largest single component of any decrease between consecutive post breeding and breeding seasons is, potentially, population mortality.

Examination of the differences portrayed during the six years when comparisons are possible (Col. G) show widely varying fluctuations, ranging from a decline of 870 (-68%) to an increase of 173 (+17%). Decreases in January censuses prevail over previous July/August counts in five of the six years, averaging 447 (-37%) annually. The average annual decrease for the entire six year period, is however, only 344 (-28%).

Discussions and Conclusions

Detailed examination of the various stilt census results from 1956-1981 show that the data are roughly comparable (especially between adjacent year groups), change within

similar limits, and in all probability represent real changes in population levels, both from year to year and from season to season.

Assessment of census data for the last sequence of years for which figures are available (1976-1981) indicate that a rather stable January population of around 900 to 1,000 individuals produced roughly 200 young by July or August most years. While the average annual increase of 472 during the most recent six year period exceeding the average decrease of 344 during the comparable period, it must be remembered that the decrease possibly represented roughly only the majority of annual mortality, i.e. early post-breeding deaths. Addition of population mortality from January to July August would probably act to raise the 344 average decrease to a number nearer the average annual increase calculated at about 472, and thus support a conclusion that at least the recent population is rather stable.

A consensus seems to have been reached among resident State and Federal biologists that the total population of Ae'o in 1977 was 1,500 individuals (32,33) though it was realized that numbers fluctuated (29,40). The HDFG report of 1 July 1977 to 30 June 1978 expressed the view that the comprehensive populations, though it was recognized that seasonal counts are not always reconcilable (28,33,35,36,46). In a separate observation Shallenberger (1978) noted that, on average, Maui and O'ahu accounted for approximately 80 percent of the Ae'o in Hawai'i (29,37).

The State-Federal Endangered Species Recovery Team stated that the primary objective of the Recovery Plan was to provide and maintain a population of 2,000 (33).

Inter-Island Movement

Munro (1944) seems to have been the first observer to acknowledge the probable exchange of Ae'o between islands, stating that the remnant population of that period appeared to move between Kaua'i and Ni'ihau (9). Though conclusive reporting of a color marking program initiated by HDFG sometime in 1977 or 1978 is not available, it is clear that individual birds occasionally move between islands. Movement from Kaua'i to O'ahu, Maui to O'ahu, O'ahu to Moloka'i, and O'ahu to Maui has clearly been documented from sightings of marked individuals (34,43,46). Also, seasonal movement of Ae'o between the islands of Kaua'i and Ni'ihau has been observed from synchronized population changes (34). From evidence to be presented later of over-water flights heard at night, it is safe to conclude that there is at least some interchange of Ae'o between all of the major Hawaiian Islands. Marked Ae'o, however, have been observed to move distantly much less frequently than locally, and then only as individuals. The extent and frequency of movement by major segments of the population, though indicated by obvious fluctuations, has yet to be specifically studied.

Productivity

Preliminary observations by HDFG biologists during the 1980 breeding season indicate that 13 percent of the Ae'o counted and classified by age were sub-adult (46). The estimate, based on sampling accomplished 31 July and 1 August, is probably low. Work from 1981 to 1983 demonstrated that age classification studies are more representative if accomplished later in the season (Shallenberger, pers.comm.). It is, of course, not claimed that the 13 percent juveniles observed in 1980 represent a fair statistical representation of the principal breeding groups.

Island of Kaua'i

Islandwide Status and Distribution

Aside from some 13 specimens obtained by five pioneer ornithologists from 1887 to 1899, there seems to be no reference to the early-day status of this species on Kaua'i (106-110). Not until initiation of waterbird inventories by HDFG biologists in 1956, and Christmas Counts by Hawaii Audubon Society members in 1963, did an understanding of relative abundance and distribution of Ae'o populations on Kaua'i begin to emerge (49-105, 11-136). Numbers of Ae'o tallied during semi-annual January and July/August censuses are presented in Table 3 (49-53, 55-65, 67-69, 71-74, 77-94, 96-99, 101, 102, 104, 105). For previously explained reasons data presented in census tables should not be accepted as necessarily indicative of actual populations, particularly during the early years when census objectives and methodology were comparatively undeveloped. Comprehensive semi-annual censuses beginning in 1977 are, however, believed to be a fair reflection of actual population size (36).

Examination of census data in Table 3 reveals widely fluctuating population levels on the island of Kaua'i in both early and recent years. Lack of consistency in censusing from 1971 to 1974 reduces the value of comparing results with later data, nevertheless it seems certain that far fewer Ae'o frequented Kaua'i from 1971 to 1974 than in more recent years.

Though count data from 1971 to 1974 are lacking, census results in January are more uniformly available over a longer time span than at any other season. Analysis shows that 15 January counts from 1956 to 1970 ranged from 0-55, averaging 15, 47 Ae'o per census, while 7 counts from 1975 to 1981 ranged from 21-318, averaging 128.86 individuals per count, over 8 times as many.

Ae'o seen on some 8 July/August counts from 1973 to 1980 range from 116 to 381, averaging 260. While only 3 censuses were apparently conducted before 1971, census results range

from 54 to 109 and average 85 Ae'o counted, thus supporting the impression gained from analysis of January censuses that Ae'o were found on Kaua'i in much greater numbers from 1971 to 1981 than from 1956 to 1970. That this species existed on Kaua'i in fewer numbers before 1971 is in agreement with that of 1) Richardson and Bowles (1964) who found Ae'o in small numbers only on a few scattered lowland marshy areas from June to August 1960, 2) Hawaii State Division of Fish and Game's 1969 classification of this species as rare on Kaua'i, and 3) Shallenberger's 1977 conclusion that the Kaua'i population increased "considerably" in "recent" years (54,66,95).

Aside from the previously mentioned influence of rainfall there seems to be no apparent cause for their dramatic overall increased use of this island in recent years. Hawaii State Division of Fish and Game biologists noted the "recent" destruction of several areas by filling, draining and commercial development during the period 1 July 1970 to 30 June 1971, but such an observation would appear to have the effect of reducing instead of increasing numbers of Ae'o on Kaua'i (70). Similarly, a report by HDFG that 1979 was a particularly poor nesting season, and that open mudflat habitat was noticeably lacking, is reflected by the poor January count (21 that year), but near-record numbers of 346 were recorded later during the July/August count (99,100). Shallenberger (1977 report) stated that the population increase he detected on Kaua'i was presumably due to the combined influence of habitat improvement, increased breeding success, and more thorough habitat coverage on surveys (95).

In addition to the foregoing, HDFG biologists and Hawaii Audubon Society members have at irregular period, reported numbers of Ae'o seen in various sectors of the island (11-136). Of these counts, only 2 seem worth mentioning: the concentration of 110 reported in the Kapaa area on the December 1977 Christmas Count by Kawahara (1978), and the 113 (including 3 juveniles) reported in Hanalei and Waioli taro fields on 31 March 1978 by Pyle (1978) (129,130). Numbers of this species listed in the remaining 24 records range from 2 to 64, but since none of these observations document the names of habitats covered in the surveys, the results cannot properly be compared.

Relative Abundance of Ae'o in 11 Quadrangles and 155 Habitats, 1961-1982, Island of Kaua'i

Results of some 22 years of Ae'o censuses on the island of Kaua'i are summarized by quadrangle in Table 4 and by habitat in Table 5. Essentially non-tabular information on Ae'o numbers in 10 additional habitats is presented in Table 6.

Of a grand total of 4,633 Ae'o counted in 1,743 censuses, some 3,840 (83 percent) were found in only 3 quadrangles, 9.46 in HANALEI, 5.21 in KEKAHA, and 4.97 in LIHUE. The average number of birds reported in each quadrangle per count was

6.55. Only 41 145 habitats surveyed (28 percent) are located within HANAIEI, KEKAHA, and LIHUE quadrangles.

A total of 756 Ae'o (16 percent) was found in tow quadrangles, the average number reported percount in each of these notably less attractive sectors being 1.14 (HANAPEPE) and 1.02 (KOLOA). Some 61 of the 145 habitats (42 percent) surveyed in these 6 quadrangles.

A major share of the total census effort was expended in counting this species in sparsely or non-utilized bagitats, as borne out by data in Table 5. For example, some 1,135 of the 1,743 counts (65 percent) resulted in a total tally of only 793 Ae'o (17 percent of the total recorded).

With reference to Table 5, no Ae'o were observed in 91 habitats (63 percent of the areas covered).

Of 54 Habitats in which Ae'o were observed at least once, a total of 31 exhibited decreased use, 20 increased use, and 3 no change when average numbers counted are compared between first and last halves of hte applicable cneus periods. Long-term use of most habitats on Kaua'i by this species thus appears to be declining. Ae'o appear to be on the increase in the Kekaha, Mana and Lihue areas while declining numbers were recorded in the Hanalei, Wipa, a nd Waioli habitats.

Information on relative abundance of Ae'o in 10 habitats is essentially non-tabular in nature and is summarized in Table 6. For the msot aprt, data in Table 6 supplements that contained in Table 5 due to overlap of geographical boundaries. However, ite seems clar that several area formerly used are not longer frequented by this species. Ae'o were reported by the "hundreds" and several specimens collected near Waimea (village) in the 1890's where none have apparently been seen in recent times. Likewise, these birds were reported abundant in Kekaha lagoons (? Mana swamp) in 1893 which was drained for agriculture use in the 1920's. Use of Kekaha Pasture and Settling Basin by a dozen or two Ae'o and the Mana Ponds by a few individuals appears to be the latest representative uses fo these general areas.

Average number of Ae'o counted in the ten most heavily utilized habitats is shown in Table 7. While census periods of the various areas vary somewhat and the data are therefore not exactly comparable, the figures are nevertheless useful in showing the relative attraction of the listed ares for this species year in and year out. Relative seasonal attractiveness of the various habitats are not compared.

An average of 19.72 Ae'o were counted in all 10 habitats during the 1961-1982 period. Numbers ranged from a high of 53.40 at Hanalei NWR Lookout to a low of 10.44 at Grove Farm Settling Basin. Other comparatively high use areas are Kekaha Settling Basin (18.68 Ae'o/census), Lihue Plantation Settling

Basin (16.13 Ae'o/census), and Mana Pasture (16.00 Ae'o/census). All of the 10 highest ranking Ae'o habitats on Kaua'i are those involved in some phase of agriculture, such as cultivation of taro, waste-water settling basins, and pastures.

During the same general period as areas listed in Table 7, Ae'o averaged over 1 but less than 10 per census in 17 habitats of wider distribution, as shown in Table 8. However, an average of only about 5 or more of this species was counted on only three of these areas, as follows: Waipa Taro Fields (7.64 Ae'o/census), Waita Reservoir (5.27 Ae'o/census), and Hanapepe Salt Pond (4.98 Ae'o census). Substantially fewer than 5 Ae'o per census were counted on the 14 remaining areas. Unlike the ten most heavily utilized habitats such as taro fields, waste-water settling basins, and pastures, water reservoirs comprised the largest single category of habitats receiving medium use by this species.

Productivity

A Hawaii Division of Fish and Game report stated that nine Ae'o nests were located in 1977 and seven in 1978, with 65 percent hatching success estimated in 1977 and 62 percent in 1978 (by end of report period) (1313). Chick survival was considered very low in 1977 and less than 50 percent in 1978. No specific localities were mentioned in what is presumed to be a survey of island-wide proportions.

A statement in an HDFG 1979 report that no nests had been found at Lihue Plantation, Grove Farm, and Kekaha Settling Basins (100), indicates that Ae'o nests had previously been noted in these areas (in addition to those reported more regularly in the Mana area and on Hanalei National Wildlife Refuge).

Some 10 of 21 Ae'o captured for marking at Kekaha Pasture on 21 September 1971 were judged to be immature, leading the reporter for HDFG to conclude that if population turnover was as great as that indicated, then nesting success was an important survival factor (76). However, in a later determination, only 4 percent of 93 examined were judged to be immature (103).

Intra-island Movement

Twenty Ae'o were color-dyed by HDFG biologists at Kekaha Pasture on 27, 28, and 29 September and their movements noted for three months. The majority were found to have flown initially after release to Kekaha Sugar Company mud settling basin. They dispersed further in subsequent weeks to Kekaha Slaughterhouse Reservoir, Hanapepe Salt Pond, and Waita Reservoir, with one travelling to Hanalei. After three months most Ae'o apparently had left the island (75).

Island of Ni'ihau

Islandwide Status and Distribution

V. Knudsen demonstrated the occurrence of Ae'o on Ni'ihau with the collection of 2 specimens, probably in the late 1880's. Rothschild (1893) was the first to mention their relative abundance on Niihau no doubt repeating what his collector, H.C. Palmer, had written him after taking 5 specimens in February and March 1891, that "a number were found on the flat lagoons" (1993-1995). No other record of their status and distribution on Ni'ihau seems to have been made until the statement by Munro (1940) that "several hundred" were estimated on "8 or 9 lagoons" on 2 November 1939 (1965).

The report by Robinson (1964) that Ae'o were present on Ni'ihau "in great numbers...between 300 and 400 on each of two pond" did not indicate when the observation was made but it was almost certainly during the 1964 breeding season (1996). The sole breeding season survey by HDFG on 12 April 1972 found 360 present on the island (1971).

Hawaii Division of Fish and Game, or their coeprators, have counted Ae'o on Ni'ihau from aircraft annually from 1968 to 1981, except for 1973 when habitats were dry (1966-1992). Except for 1978 winter (pre-breeding) censuses have supplemented summer (post-breeding) counts most years from 1975 to 1981. Results are shown in Table 9.

Examination of data in Table 9 shows that from 1968 to 1981 Ae'o on Ni;ihau ranged in number from 44 to 203 during the January (pre-breeding season) counts, and from 0 to 155 during the July/August (post-breeding) censuses. Other records indicate that the number of Ae'o on Ni'ihau is dependent on water levels in the ephemeral playas, and that most biologists believe that the majority of Ae'o on Kaua'i breed on Ni'ihau (1969, 1973-1976, 1981, 1984, 1986, 1988).

Distribution of Ae'o among the dozen or so habitats on Ni'ihau are shown in Table 10 for those years in which data were available.

Examination of data in Table 10 shows that, in terms of average numbers counted, habitats may be stratified progressively according to degree of use into four principle groups, as follows: in group 1, the most heavily used, Puuwai Pond(s) (41), Kaununu Res. (32), and Halulu Lake and Ditches (30); in group 2, Puu Alala Pond(s) (15.8), Nonopapa Lake (12.8), and Kiekie Pond(s) (11.5); group 3, Haao Res. (6.5), Poheulua Res. (6.2), Halalii Lake and Ditches (6.2), Keanuhi Res. (5), Kaumuhonu Res. (4); and group 4, the least used, Palikoae Pond (0) and Kaalialinui Valley (0).

A different ranking of habitats is suggested by the distribution of this species on 12 April 1972 (the sole breeding season census) when a total of 360 were found in the following areas and numbers according to decreasing degree of use: Puuwai Pond(s) (188), Puu Alala (65), Halulu Lake and Ditches (55), Kaununu Res. (32), Pohueloa Res. (10), Keanauki Res. (8), and Nonopapa Lake (2). Though Puuwai Pond(s) ranks first in both cases, the order of the next three ranked areas is altered when the average number observed during regularly scheduled counts is compared with the single census of 12 April 1972. This seems to suggest that Puuwai Pond(s), Puu Alala, Halulu Lake and ditches, and Kaununu Reservoir tend to attract and hold more Ae'o than the remaining areas.

Island of O'ahu

Islandwide Status and Distribution

Some of the earliest observations of Ae'o in the Hawaiian Islands were recorded on the island of O'ahu. Stejneger (1888) mentions specimen(s) taken in 1870 in or near Honolulu (2099). S. B. Wilson obtained examples near Koko Head in 1887 and/or 1888, at Waialua in October 1888, and others from undesignated collector(s) in August and September 1892 after his return to England (Wilson and Evans 1893, Banko 1979) (2100, 2105). Perkins (1903) stated that this species was formerly "familiar" near the railroad a mile out of Honolulu but was, even then only rarely seen there (2102). H. C. Palmer took 2 specimens on O'ahu on 6 May 1893 but failed to record the area where they were taken (2103). An undesignated collector obtained 5 specimens in June and August 1895 but likewise did not specify the locality (2104).

No counts of Ae'o seem to have been made on Oahu from about 1897 to 1932, a period of some 36 years. Beginning in 1933 J. Northwood began to note this species during visits to various habitats in windward O'ahu, and he was joined in this practice by members of the Hawaii Audubon Society a few years later, around 1940. Counts by HAS members furnish most of the information on Ae'o numbers during the 16-year period 1940 to 1955. Hawaii Division of Fish and Game (now Forestry and Wildlife) began censusing waterbirds, including Ae'o, a decade after the initial game bird survey of the major islands by Schwartz and Schwartz in 1946 and 1947. Numbers of Ae'o counted during HDFG annual and/or semi-annual surveys on O'ahu are shown in Table 11 (2057-2098).

Examination of data in Table 11 shows that 25 January censuses and 10 July/August counts were conducted from 1956 to 1981. One additional count was made on 12 April 1972. January counts range between 107 and 549, averaging 300 for the 25 censuses conducted. July/August counts range between 231 and 785, averaging 511 for the 10 censuses carried out. The significant difference between average January and average July/August censuses, when correlated with what is known of

Ae'o movements, suggests a major exodus from O'ahu to Ni'ihau and Kaua'i during the breeding season, and return during the post-breeding season. The all-time low count of 114 Ae'o censuses islandwide on O'ahu on 12 April 1972 during the onset of breeding activity, serves to strengthen this impression. July/August census figures marking return of post-breeders to O'ahu include young of-the-year surviving pre-flight mortality.

Overall population trend of this species using O'ahu habitats may be traced by calculating averages for 5 year January and July/August census periods. The average numbers of Ae'o counted during five successive 5-year January census periods, from 1956 to 1981, are 330, 288, 246, 263, and 370, indicating modest decline and rebound. The average number of these birds counted during two successive 5-year July/August census periods, from 1968 to 1980, are 536 and 468, indicating modest decline. Overall, the total population of Ae'o utilizing O'ahu appears to be relatively stable.

In 1969 the Ae'o was officially classified as a rare species by the Hawaii State Division of Fish and Game (2076). Factors which may have affected numbers of individuals censused during the 1975 to 1977 period are mentioned in the reports for these years (2087, 2091).

Relative Abundance of Ae'o in 15 Quadrangles and 125 Habitats, 1933-1982, Island of O'ahu

As mentioned previously, counts and population estimates of Ae'o in various localities on O'ahu are lacking for a 36-year period, from about 1897 to 1932. However, some 2,333 censuses, summaries or estimates of Ae'o were recorded from 1933 to 1955. From 1956 to 1982 (2106-4438). Members of the Hawaii Audubon Society tallied the majority of observations from 1933 to 1982 period.

Arrangement of the nearly 2,500 Ae'o census records in chronological and geographical order reveals many ambiguities and inconsistencies which thwart systematic comparison and analysis. In large and complex habitats where boundaries are indefinite and names may be synonymous and overlapping, such as Pearl Harbor, the task of assigning casual records into definitive habitats becomes well-nigh impossible. The problem is further confounded by census irregularities or inconsistencies using by a host of observers during the 50-year period, such as recording presence of this species in terms of "average daily use", "scores", "few", etc. instead of numbers.

For the foregoing reasons, the 2,333 records of Ae'o on O'ahu have been organized for analysis in three principal groups. Some 233 counts and estimates were made by a number of observers with various objectives in areas hopelessly confounded by synonyms, indefinite boundaries and overlap with

other habitats in adjacent quadrangles. These badly tangled and confused groups of data, all gathered in the highly utilized Pearl Harbor complex, are lumped in the Appendix by habitat groups under the heading MULTIQUADRANGLE (2106-2338). Information in this category will be examined first.

The second and largest group of census records, some 2,020 in all, are found listed in the Appendix by habitat, or synonym, under the designated QUADRANGLE name (2419-4438). This latter grouping, although by no means uniform, is the least qualified and allows the most Counts of 330 or more Ae'o during the 38 Year period (1944-1981) show several characteristics, as follows:

- a. Numbers of individuals in the 28 counts ranged from 300, the minimum listed, to a high of 641. (The only other record of more than 300 Ae'o seen in a single concentration of O'ahu is that of ca. 1000 estimated by members of the H.A.S. 26 January 1958 on Salt Lake, proximate to Pearl Harbor) (4089).
- b. Counts of 300 or more of this species were made in two sets of consecutive month groups, July-August-September-October followed by January-February. Traditional censuses of waterbirds by HDFG and USFWS in January and July/August tend to inflate the number of high counts occurring during the months cited; however, counts recorded by H.A.S. members suggests much the same seasonal pattern.
- c. More than one high count in a given month and year occurred four times in the 38-year period. Number of such occurrences shown in parenthesis (), and average counts, are as follows: August 2970 (2), average 482/census; August 1976 (2), average 562/census; September 1976 (2), average 481/census; and October 1976 (5), average 383.4 census.
- d. Number of high counts occurring per month is as follows (include multiple counts per given month and year as one): July (5), August (7), September (3), October (2), and January (3), February (1). As related to annual population behavior these periods of increased density might tentatively be described as post- and pre-breeding season phenomenon. Further study is needed to establish the existence of such behavior for certain, and its possible population significance if found to be real.
- e. When high count occurrences are examined by year over the entire 38-year span it is found that none at all were made for the first nine year period, 1944-1952.

Presumably, the lack of high counts from 1944 to 1952 is at least partially attributable to inactivity by

H.A.S. members (field trip development then being in its infancy) and HDFG which did not initiate waterbird counts until 1958.

Beginning in 1953, counts of 300 or more Ae'o were made for 14 of the next 18 years until 1970. In the following 11 years, from 1971 to 1981, high counts were made in only two years, 1973 and 1976. No counts of 300 or more Stilts have been reported in the past five years.

It is not known for certain whether the apparent decline in Ae'o using the Pearl Harbor habitat complex reflects lack of censusing activity, population decline, or both. That HDFG censuses, at least, have been carried out regularly from 1971 to 1981 is shown in Table 11. Thus, a long-term population decline in numbers of Ae'o utilizing Pearl Harbor habitats, rather than lack of censusing activity, appears to be indicated. However, the average of the first 10 high counts of 300 or more birds (410) is significantly lower (9 percent) than the average counts in cases where more than one high count exists in a given month and year (as in 1970 and 1976).

* * * * *

Using information supplied by the U. S. Fish and Wildlife Service for the period October 1979 through September 1981, an average of 67 Ae'o used Pearl Harbor National Wildlife Refuge (West Loch and Pearl City Units) on a daily basis. Information supplied reveals great variation in numbers of these birds using the West Loch and Pearl City Units from month-to-month, season-to-season, and year-to-year, no doubt a reflection of the transitory needs of the population (2973-3325, 3689-3958, 3959-3965). The pertinent data, including some gaps, are exhibited in Table 13.

On average it seems that roughly twice as many Ae'o were accommodated on the Pearl City Unit than on the West Loch Unit during the 1976 to 1979 period. Average daily use data supplied for Honouliuli from 15 November 1981 to June 1982, indicates that 15 Ae'o used this Unit during the period indicated, up slightly from 1979 (3959-3965).

1. Ae'o Recorded In More Than A Single Locality

In some 78 cases (2341-2418) numbers of Ae'o counted on 2 or more habitats have been lumped, thus obscuring numbers creditable to each location. While this practice generally devalues the use of the resulting sum for specific purposes, a few such records or associated notes are worthy of special mention, as follows:

a. Development of Kaelepulu Pond for residential housing

(Enchanted Lake subdivision) commenced about 1958 (2349).

- b. It was suggested in 1958 that Christmas Counts of water birds at Damon Pond be abandoned due to encroachment of mangrove (2350). Thus Ae'o may actually have been displaced from this habitat before it was destroyed by development as indicated elsewhere.
- c. Combined census data for Kuapa and Paiko Lagoon supports a relatively high value of these areas before development reduced use of each to insignificance, as indicated in Table 13a.
- d. The seasonal nature of Ae'o use of Keehi Lagoon and the adjacent habitats is shown by a maximum of 87 (67 together on one occasion) seen in a total of 60 censuses, 12 Dec. 1970 to 28 Apr. 1971, and only 1 or 2 seen on an equal number of counts (60) from 31 Jan. to 30 Apr. 1971 (2374-2375). Counts of 105 on 13 Dec. 1971, and 50 on 17 Dec. 1972 were made later in the same area (2377, 2383).
- e. Shallenberger noted in 1977, according to then recent surveys, that nearly half of the recorded Statewide population of Ae'o was distributed throughout the Pearl Harbor complex of Habitats (2399).

2. Ae'o Recorded in Single Habitats on O'ahu, 1933-1982

As mentioned previously, the largest group of population records (2,020 in all), are listed in the Appendix by habitat or synonym(s) under the appropriate quadrangle name. To simplify analysis of this large body of heterogeneous information, the use of designator terms are employed in Table 14 to represent those of the usual multiple name(s) of single habitats. For a more specific description of the habitat(s) represented by designator terms, the reader is referred to the Appendix. The complete terminology of any given habitat, including synonym(s) will be found in the Appendix by referring to the Serial No.'s listed after designator terms.

Ae'o census data of 76 habitats islandwide from 1933 to 1982 is summarized in Table 14.

Examination of data in Table 14 shows that for the historical period 1933-1982, Ae'o were broadly distributed throughout the island of O'ahu, occurring in all 15 quadrangle (though not yet censused in one - HAUULA). The five top-ranked quadrangles with average number of Ae'o counted in habitats within their boundaries are as follows: WAIPAHAU (66.68), HONOLULU (44.56), MOKAPU (29.73), PUULOA (22.01), KAHUKU (19.28). Ae'o in single habitats thus tend to be distributed in the Pearl Harbor area (WIPAHAU, HONOLULU,

PUULOA), and on the southeast (MOKAPU) and northeast (KAHUKU) portions of the island. The average number of this species counted in each of the remaining 8 quadrangles is approximately the same as that of the 4th ranked quadrangle (PUULOA), 24.88 vs 22.01 for PUULOA.

A more detailed examination of Ae'o numbers in the 76 individual habitats shows, as one might expect, great variation. An average of 20 or more individuals were counted per census in 16 habitats within 7 quadrangles, as listed below.

- a. EWA. Barbers Point. An average of only 20 Ae'o were tallied on two counts, in 1964 and 1968. Habitat now apparently non-existent.
- b. KAHUKU. Average number of Ae'o for Kii Pond (274 counts from 1946 to 1982) is 22.93, while that for Punamono (50 counts from 1968-1980) is 5.46. The average daily use figure from 1978 to 1981 for James Campbell National Wildlife Refuge, including both Kii Pond and Punamono habitats, is 78 birds.

If the average daily use data are representative, the use of the Kahuku Ranch Area by Ae'o has tripled since establishment of the Refuge. Shallenberger (pers. comm.) has since advised that if census data from 1982 and 1983 were included, the average daily use of Campbell NWR would be up at least 50% over that of the late 1970's due to the growing attraction of the Lowe (now Amoriant) aquafarm in Kahuku.

- c. WAIPAHAU. Ae'o census data for the Pearl City Peninsula and Pearl City (Waiawa) Unit of PHNWR are practically synonymous for comparative purposes, that for Pearl City Peninsula representing for the most part counts before establishment of the federal Refuge. Ten censuses on Pearl City Peninsula from 1970 to 1977 averaged 19.30, while 351 counts on the Pearl City (Waiawa) Unit from 1976 to 1980 averaged 71.96. Ae'o use of the Pearl City area has more than doubled since establishment to mitigate loss of habitat in the reef runway area.
- d. MOKAPU. An average of 24.21 Ae'o were counted at Kaelepulu Pond from 1934 to 1979. Tallies during the second half of this 50-year period show a sharp decline when compared with those made during the first half (46.29 vs. 8.79), thus reflecting its conversion from a wild marsh to residential subdivision beginning about 1958 (2349). Counts of 200 to 300 Ae'o were made on Kaelepulu during the 1944 and 1945 Christmas Counts, while nesting was noted as late as 1957. A maximum of only 8 individuals has been counted in this area since 1969. Sequence of destructive factors

reducing this area of major importance to one of insignificance is well documented.

Kaneohe Marine Corps Air Station and Nuupia are, in terms of Ae'o habitat, practically synonymous. Some 88 counts logged on KMCAS from 1938 to 1981 averaged 45.82 birds per census, while 17 counts from 1947 to 1980 credited to Nuupia averaged 45.94. It seems clear from the composite data gathered from 1938 to 1981 that KMCAS/Nuupia ranked about equally with that of James Campbell National Wildlife Refuge in terms of use, though somewhat behind that of the Pearl Harbor complex.

- e. PUULOA. An average of 24.80 Ae'o were counted on the honouliuli Unit of the Pearl Harbor National Wildlife Refuge in 259 counts from 1974 to 1980. Some decline in use of this area is indicated when average numbers counted during first and last halves of this period are compared (29.71 vs. 19.88).

An average of 21.67 birds were counted on the U.S. Navy Rifle Range in 3 counts from 1956 to 1958. The data for this habitat may be confounded with that listed under EWA for Barbers Point (habitat now apparently non-existent).

- f. HONOLULU. Some 41 counts of Keehi Lagoon and Islets from 1938 to 1980 resulted in an average of 38.05 Ae'o censused per count. Counts since 1977, after creation of islets intended to mitigate damage to habitat by construction of the reef aircraft runway, fell dramatically, from 39 (average of 2 counts in 1977), to 8.2 (average of 5 counts from 1978 to 1980). Ae'o evidently find the Pearl City (Waiawa) Unit of Pearl Harbor NWR more attractive now.

A total of 32 counts of the Moanalua-Mapunapuna-Kalihi Flats habitat complex from 1933 to 1947 resulted in an average tally 96 Ae'o per census. As many as 200 individuals were counted in this low-lying area as late as December 1944, but numbers were noted to be greatly reduced after extensive land filling began about 1945. The Moanalua-Mapunapuna-Kalihi Flats habitat complex for Ae'o is now apparently non-existent.

An average of 32.95 of this species was censused in 44 counts at Salt Lake from 1956 to 1981. Average counts made during the second half of this period fell sharply when compared with censuses made during the first half of the period (56.86 vs. 9.05). The high average census computed from the first half of the 1956 to 1981 period was strongly influenced by the count of ca. 1000 made by members of the H.A.S. on 26 January

1958, the largest concentration of Ae'o ever recorded in the Islands (4089). Thirty-seven was the greatest number observed at any one time from 1970 to 1972. An average of only 6 were counted in 9 censuses from 1979 to 1981, when only portions of the Lake remained after the balance was filled in to complete construction of a golf course initiated ca. 1971. Salt Lake, as Ae'o habitat, is now virtually non-existent.

After first being noted by Perkins (1903) on Quarantine (Sand) Island in the 1892 to 1897 period census data for this species beginning in 1940 is possibly confounded with that of Keehi Lagoon and Islets with which it is associated. Needless to add, Sand Island itself now offers no habitat to Ae'o or any other waterbird, the long-since filled-in area being used solely for industrial purposes today.

- g. KOKO HEAD. An average of 30.25 Ae'o were censused in 32 counts on Kuapa Pond from 1947 to 1976. Use of Kuapa declined beginning about 1964 and by 1976 no Ae'o were seen. Ae'o use of Kapa Pond is insignificant or non-existent today.

HDFG censused 35 Ae'o during the 1970 January waterbird census at "Waimanalo". There seems to be no other information in the literature indicating existence of Ae'o habitat in that immediate locality. If Ae'o habitat existed in the Waimanalo area at one time, it is assumed that it was subsequently destroyed by urban development.

Of the 16 habitats mentioned in the foregoing summary, 3 groups of 2 or more habitats are of synonymous or overlapping nature: Kii - JCNWR, including Punamano; Pearl City Peninsula - Pearl City (Waiawa) Unit (PHNWR); KMCAS - Nuupia; thus reducing to 13 the number of habitats outside the Pearl Harbor complex considered earlier. Further reduction of the number of habitats from 13 to 9 seems justified by the low number of censuses (3 or less) creditable to 4 of the areas, suggesting that the data available are insufficient to establish their historical value to Ae'o. Four of the remaining 9 areas are no longer used by significant numbers of Ae'o: (Kaelepulu, Salt Lake, Kuapa, and Moanalua-Mapunapuna-Kalihi Flats). Of the 5 remaining habitats, 2 are in the Pearl Harbor area (Pearl City (Waiawa) Unit, West Loch (Honouliuli) Unit, Islets), while 2 are located some distance away (Kii and Punamano Units, JCNWR; and KMCAS-Nuupia). Only one of the latter group of 5 habitats (Keehi Lagoon and Islets) is ownership (KMCAS) is owned by the military, while the remaining 3 are dedicated to wildlife preservation (National Wildlife Refuges).

Reference to Table 14 reveals a total of 60 habitats on which fewer than an average of 20 Ae'o per census have been

recorded. However, information on relative abundance of Ae'o in 5 of these habitats is in other than numerical form, while none were counted in another 17 habitats, leaving an actual total of 38 habitats on which an average of less than 20 Ae'o per census were counted. The average number of this species censused over the years on these remaining 38 habitats is 4.04 individuals per count. When average number of Ae'o seen during first halves of censusing periods are compared with average counts made during last halves, in some 28 habitats on which a total of 40 or more were counted, 22 (79 percent) show decline in use, while only 6 (21 percent) indicate increasing use.

On only 3 (7.9 percent) of the 38 habitats were an average of more than 10 Ae'o censused, as follows: Kaluapuhi (MOKAPU QUAD.) 14.50; Fort Kamehameha - Hickam Harbor 11.11, and 9 habitats (24 percent) showed counts between 5 and 10 individuals, as follows: Ukoa 5.28 and Wialua Settling Pond 6.67 (HALEIWA); Makaha 5.13 (WAIANAE); Punamano 5.46, Kahuku Air Strip 5.55, and Kuilima 7.42 (KAHUKU); KMCAS Sewage Lagoon 6.75, and Kaneohe Beach Park 9.50 (MOKAPU); and Paiko Lagoon 7.24 (KOKO HEAD). Thus, more than two-thirds of the less-than-20-Ae'o-habitats hosted an average of fewer than 5 birds.

Productivity

Determination of relative abundance and distribution of Ae'o in the pre-and post-breeding seasons of January and July/August, furnishes little insight into population productivity. Nevertheless, enough information on nesting has been gathered in recent years by HDFG on the Kaneohe Marine Corps Air Station, by federal biologists on National Wildlife Refuges, and islandwide in past years by members of Hawaii Audubon Society, that certain generalizations are possible. Some 79 records and summary statements by such observers form that basis of the following account.

One of the most important breeding habitats for Ae'o on O'ahu, at elast through the 1970's, was the sea-level pond complex on Kaneohe Marine Corps Air Station. The initial nest on KMCAS, probably along the shore of Nuupia Pond, seems not to have been documented until 3 May 1964. By 1966 moderate to abundant nesting was noted in that area (3482, 3483, 3497). Nesting studies on KMCAS were initiated by HDFG in 1974 where from 11-19 nests, and production of at least 6 young, were noted (the actual number of nests found in 1974 depends upon interpretation of ambiguous and scattered data (3522, 3528, 3550, 3553, 3555, 3557, 3559). For similar reasons it is not clear whether as few as 4 or as many as 7 nests were located on Nuupia in 1975 (3531-3536, 3560). However, the number of nests found on Nuupia during succeeding studies seems to be more explicit, as follows: 1976 (35), 1977 (69), 1978 (23), 1979 (32), and 1981 (possibly 51) (3561, 3567, 3574, 3479). These data may include information from intensive studies by Coleman (1981 PhD thesis) who reported censusing an average of

60 breeding birds at Nuupia for 3 years, from 1978 to 1980 (3577a). Young were noted as early as 10 March, while nests (partial data only) were found as late as 25 June (3550, 3559). Hatching success of average 4-egg clutches seems to have ranged from 15 (1976) to 19 percent (1978), depending again on how incomplete and fragmentary data are interpreted. Predation and flooding of nests in that order, seem to have been the principal causes of failure.

Disturbance by human activity, another obvious potential cause of nesting failure in areas located immediately adjacent to residential development, does not seem to have been evaluated.

The sole records of nesting on KMCAS in habitat other than Nuupia Pond seems to be limited to observation of a few nests in 1966 on Kaluapuhi Pond (3584, 3585, 3587).

Three miles to the south of KMCAS, nesting of Ae'o was noted at Kaelepulu Pond on several occasions, beginning on 13 May 1934 and ending with a tally of 5 nests on 30 March 1957, shortly before its development as a residential area (Enchanted Lake subdivision) (3348, 3350, 3370, 3376). Though Kaelepulu may have been a significant Ae'o breeding area before urban development, there seems to be no written evidence to support such a possibility.

Nesting or young Ae'o have been reported many times in various habitats of Pearl Harbor over the years, on dates ranging from 15 April to 7 August. Some 6 of these records apparently occurred on areas outside of what are now component units of the Pearl Harbor National Wildlife Refuge (2190, 2208, 2221, 2232, 2239, 3851). For example, Coleman (1981 PhD thesis) censused an average of 50 breeding Ae'o at Waipio from 1978 to 1980 (2303a). Scattered notes by federal biologists also confirm the nesting of small numbers of Ae'o on the Pearl City (Waiawa) and West Loch (Honouliuli) Units of the PHNWR from 1976 to 1978 (3002, 3189, 3200, 3201, 3203, 3205, 3206, 3209, 3213, 3224, 3231, 3232, 3693, 3775, 3836, 3838, 3849, 3850). However, the maximum number of young reported at any one time has never exceeded 8 on the Pearl City (Waiawa) Unit (8 July 1976, 6 July 1978), and 2 on the West Loch (Honouliuli) Unit (17 July 1976; 30 April, 20 June 1978), though total numbers produced during the entire season may have been larger. For example, an average of 40 breeding birds was censused by Coleman (1981 PhD thesis) during the 3-year period 1978 to 1980 at each of the Waiawa and Honouliuli Units (2302a, 3325a, 3958a, 4136a).

Ae'o nested in small numbers on Kii Pond in James Campbell National Wildlife Refuge during the 1960's and 1970's (2564, 2599, 2600, 2602, 2603, 2686, 2813). These 7 records include the nesting of 3 pairs in May 1963, 7 active nests and 12 young produced in 1971, and a chick killed and eaten by a night heron (*Nycticorax n. hoactli*) on 9 May 1980. Nesting at Kii increased in the late 1970's and early 1980's, apparently in

response to improvement of habitat in the Refuge and nearby aquafarm (Shallenberger, pers.comm.). An average of 70 breeding Ae'o was censused at Kii during the 3-year study period 1978-1980 by Coleman (1981 PhD thesis) (2813a). Of greater significance were the 65 immatures detected on the early October recruitment survey for the area in 1983 (Shallenberger, pers. comm.).

Intensive study of some 415 Ae'o nests in 6 widely distributed habitats on O'ahu by Coleman (1981 PhD thesis) demonstrated that 1) nesting occurred between mid-February and late August, with a peak in May; 2) 80% of the nests were located on islands, usually close to the water on bare ground eggs; 4) both parents share equally in incubation which lasted 23 to 26 days; 5) mean hatching success was 57% (2.0 eggs/nest) (23% of the hatch); 7) the family group of parents and juvenils was retained throughout the following fall and winter; 8) juvenile plumage, resembling that of Himantopus mexicanus mexicanus, is retained for 7 to 9 months after fledging (2097a).

Movement

Of a total of 117 Ae'o which were color-marked by HDFG (110 on O'ahu) from December 1977 to August 1979, 92 were seen at least once (43). From re-sighting of marked individuals it was concluded that there was a moderate amount of movement of adult and juvenile birds between nesting areas on O'ahu, though most remained in the vicinity of nesting grounds at James Campbell and Pearl Harbor NWR's, and Nuupia Pond on KMCAS. One juvenile, however, was recorded nearly 22 miles distant after banding. The amount of inter-island movement is not clear, there being only 2 examples from the 110 marked on O'ahu. One male banded on James Campbell NWR on 30 March 1979 was seen at kaunakakai sewage pond, Moloka'i, on 14 September 1979. A male banded on Pearl Harbor NWR on 14 March 1979 was seen at Kanaha Pond, Maui, on 6 October 1979 (43).

Island of Moloka'i

Islandwide Status and Distribution

The earliest specific record of Ae'o on the island of Moloka'i seems to be that of Wilson (1893) who noted the taking of downy young specimens at kaunakakai in June 1888 (4466,4495). Rothschild (1900), citing information received from his collector, H. C. Palmer, noted that Ae'o were not doubt where 4 were collected on 10 February (Banko 1979 report) (4467,4468). Later, on 16 May 1893, Perkins (field notes) reported seeing a small flock and collection of 2 specimens somewhere along the beach from Kaunakakai to Makakupaia (Banko 1979 report) (4469,4496,4497).

Hawaii Division of Fish and Game biologists have counted Ae'o on Moloka'i in connection with waterbird surveys nearly

every year from 1958 to 1981. Results are shown in Table 15. It is not clear whether zero figures (0) listed for 1958, 1959, 1963, 1969-71 in Table 15 represent results of actual counts or that no census was conducted, as indicated for some years (1965, 1966, 1968, 1970-1975, 1977, 1978). For purpose of computing averages it is assumed that the figure equals no census.

It should be noted that the number of Ae'o counted on Moloka'i in July or August averaged much higher than those counted in January, whether considered comprehensively or only for those years when both January and July/August counts were conducted. The disparity between winter and summer counts suggests an annual prebreeding season exodus from Moloka'i.

As shown in Table 15, the average number of Ae'o counted on Moloka'i for the first four January censuses (1960-1962, 1964) is 9, while the average for the last four years, is 12.75. While the average count of the last four years, compared with that obtained during the first four counts is high, at least a portion of the average increase may be due to better coverage.

Shallenberger (1977) thought that HDFG counts of Ae'o on Moloka'i are likely to understate the population actually present since individuals find suitable feeding habitat along the entire southern shore in a wide variety of habitats and tide conditions. Shallenberger (1977) also calculated that numbers found on Moloka'i averaged less than one percent of the Statewide population (4459).

Though Bell (1965) saw "many" Ae'o on mudflats along the south side of Moloka'i enroute to Halawa Valley in August 1964, only 1 individual was seen in several other "lee shore" surveys in 1966, 1975, 1978, 1979, and 1980 (4470-4478). Results of other such observations in specific habitats are detailed by quadrangle, as follows.

ILIO POINT Quadrangle: The only record of Ae'o applicable to the extreme western and dry end of Moloka'i seems to be that of Shallenberger (1977) who noted that N. Pekelo reported hearing this species calling as they flew over his head at night, possibly on their out to sea (4479).

MOLOKAI AIRPORT Quadrangle: Two surveys at Maunaloa and 5 at Moomomi from 1975 to 1980 have all been negative for Ae'o (4480-4486); however, at Palaa Pond and Pakanaka mudflats Bryan (1908) termed this species "resident" in 1907; Pekelo (1970) noted 2 on 2 May 1969, and Shallenberger credited this species with at least temporary residence there (4487, 4488, 4491). Nevertheless, 2 surveys by HDFG on 20 August 1971 and 1 August 1975 found no Ae'o present in these areas (4489, 4490).

KAUNAKAKAI Quadrangle: Five habitats have been censused at least once for Ae'o: Two surveys at kalae (?Meyer Lake)

(August 1979, January 1980), 2 at Kuulapuu Reservoir (August 1975, January 1980), and 1 at Alii Fishpond (August 1975). Results were all negative and these areas apparently were not covered again (4492-4494, 4546, 4547). In the Kaunakakai area Ae'o were first reported in 1888 by S. B. Wilson, as mentioned previously (4495). After sighting and collection of this species in the area by Perkins in 1893 (4486, 4497), Childs (1945) seems the third to report them there, stating that he saw more than 25 in an old rice paddy east of town (4498). HDFG and USFWS personnel have been sighting Ae'o in the Kaunakakai pier and sewage pond areas with increasing regularity since 1973 (4499-4545). Results, divided into two seasonal periods, are listed in Table 16. Since there seem to be no records of this species breeding on Moloka'i in recent years, the counts given for the March-July period probably represent mostly temporary residents. Seasonal averages are shown in parenthesis ().

As shown in Table 16 there are marked differences between the average number of Ae'o present in any given year during the March to July breeding season and those on hand during the non-breeding season. While many more counts of this species were made from August to February than from March to July, the grand average of the latter period shows fewer than half the number present at Kaunakakai during the breeding season (6.14) than were present during the contra-breeding period (14.36). The tendency of Ae'o to be away from Kaunakakai during the breeding season matches their general absence islandwide.

Although Ae'o were once seen using the Ooia-Kaluaapuhi Fishpond - Kalamaula habitat complex occasionally, they have been noted in this area with decreasing frequency in recent years. Pekelo (1964) classed Ae'o as "rare" in this locality, having recorded only 13 in 10 years of observation (4548). Subsequently, 3 were seen on 3 September 1969 and 4 were observed on 10 November 1969 (Pekelo 1970) (4549, 4550). Later, Pekelo (1973) recognized historical use of the area by this species and stated that a resident flock of 13 were observed there for a year (4551, 4552). Hawaii Department of Fish and Game recorded 6 in the Ooia area in 1973 (4553), but 9 surveys by USFWS in 1976 (1), 1977 (7), and 1980 (1) found none there (4553-3461, 4563). Shallenberger (1977) report) recognized historical use of this area by Ae'o and stated that there was little suitable habitat, but that they continued to appear there irregularly in low numbers (4562).

KAMALO quadrangle hosts only 3 habitats for Ae'o none of them very useful in the past. However, on Kakahaia (Pond), now a National Wildlife Refuge, USFWS apparently logged 8 of this species in 1966. On 7 August 1970 HDFG counted 18 at Kakahaia, and Carlson reported the occurrence of 27 there on 21 October (4565, 4566). Two were also recorded there by USFWS on 20 August 1971 (4567). Coleman (1977) acknowledged that a few were noted on early visits to the area by USFWS, but stated that none had been seen since (4568). In some 40

censuses of Kakahaia by USFWS and HDFG from August 1975 to September 1979, Ae'o were censused only twice - 1 on August 1 or 2, 1979, and 4 on 15 September the same year (4569-4608). Census data from HDFG and "average daily use" figures by USFWS indicate that from October 1979 to January 1982, Ae'o were logged only 3 times on Kakahaia - once each during the periods October to December 1979, October to December 1980, and January to March 1981 (4609-4618). However, Shallenberger (pers. comm.) advised that since completion of a shallow 6-acre impoundment west of the main marsh in the summer of 1983 about a dozen Ae'o have been using the area, and he expected numbers were likely to increase in the future.

Of the two remaining habitats in KAMALO quadrant, Shallenberger (1977 report) counted 2 Ae'o at Kamalo on 20 May 1977, though HDFG found none there in January 1979 (4619, 4620). HDFG found 2 of this species at Ualapue Pond in January 1978 but none have apparently been seen there since (4621).

In the last remaining quadrangle, HALAWA, 2 HDFG surveys at Halawa in January 1978 and January 1979 were unsuccessful in finding Ae'o there (4622, 4623).

Productivity

Except for sighting of young Ae'o at Plaau in 1907 by Bryan (1908) there appear to be no records of Ae'o breeding on Moloka'i (4487). Judging solely from the sparseness of records which typify most areas on that island in recent years, habitats may be either too short of essential resources to support regular breeding or, as perhaps the case at Kaunakakai, characterized by too much human activity. Lack of breeding season surveys also suggest that nesting by the few individuals usually present may have been overlooked.

Movements

Since Ae'o have never been banded or color-marked on Moloka'i, movement patterns are unknown. There is, however, record of 1 male Ae'o color-marked on O'ahu on 30 March 1979 which was seen 15 September 1979 at Kaunakakai (4535). This observation fits the assumption of a post-breeding influx following a prebreeding exodus. The subject of intra-island movements was addressed previously under the heading Historical Status and Distribution in the Archipelago.

Island of Lana'i

There seems to be only 1 record of Ae'o on Lana'i, the report by Pyle (1981a) of 2 that landed at Lanai Airport's puddle-strewn runway on 1 June 1980 and remained ten minutes before resuming flight (4624).

Island of Maui

Early Records, 1897 to 1949

Ther report by Finsch (1880) that he observed Ae'o on the "lagoon" at Kahului sometime during his June and July visit in 1879 is the sole record of this bird in a specific locality on Maui before 1900 (4593). The next observation seems to have been made some 69 years later - the counting of 26 in "No. 10 Reservoir" - apparently in November of 1948 by Munro (1949a) (4657). "No. 10 Reservoir" is most likely located near Kahului in PALA quadrangle. The estimate by CHilds (1949a) that there "must be 100" of this species on Kanaha Pond, made on 23 January 1949, is the third and last observation record during the 70-year time-span. There seem to be no collection records of Ae'o specimens on the island of Maui.

Islandwide Status and Distribution

Ae'o on Maui are limited in distribution, being found only on 2 natural habitats - Kealia Pond when temporarily flooded, and on the premanent waters of Kanaha Pond. They are also observed occasionally on various impounded ponds and reservoirs scattered about the central valley district. Ae'o have been counted by HDFG in all of these habitats since 1957. The combined data of the resulting censuses are presented in Table 17 (4625-4656).

As indicated by the total islandwide census for Maui from 1957 to 1981, an average of only 214 Ae'o were counted in January as compared with the average of 377 during July/August. Data for both winter and summer counts are available only for the period 1968 to 1970 and 1979 to 1980, however comparison between January and July/August averages for these 5 years show an even greater spread, an average of 199 being present in January vs. 417 tallied in July/August. The 419 counted in the sole breeding season survey of 12 April 1972 suggests that, contrary to the movement pattern on Moloka'i, many return to Maui for nesting after a winter exodus.

Shallenberger (1977 report) calculated that over a 20-year period, the Ae'o population on Maui averaged nearly 40 percent of the species censused Statewide. He also found that 1) counts on Maui have not fluctuated as widely as on other islands, presumably reflecting, as least in part, lack of seasonal habitat change at Kanaha and, 2) summer counts on Maui are generally higher than winter counts due to return of breeding birds and recruitment of young into the population (4650).

Examination of data in Table 17 shows no clear long-term trend of Ae'o population. Total numbers censused during the 5-year January to February period of 1966 to 1970, when compared with those censused from 1976 to 1981, increased 24 percent (1045 vs. 1296). However, total numbers of Ae'o

censused during the 5-year July/August period of 1968 to 1973, when compared with those censused from 1973 to 1980, declined 33 percent (2162 vs. 1443).

One of the combined islandwide census on Maui by HDFG has been the count obtained from plantation irrigation reservoirs (4658-4687). These data are exhibited in Table 18.

Average counts for all years in Table 18 show that July/August census results are larger (35 percent) than the average January tally. Since the reservoirs visited each year by HDFG are not identified in their survey reports it is not at all certain that coverage was consistent. Hence census data representing counts on reservoirs may be only roughly, rather than strictly, comparable year-to-year.

A few Ae'o are also known to frequent residential and coastline habitats other than Kanaha or Kealia according to Hansen (1975) and Kepler (1980); however, average numbers of this species in such localities are apparently insignificant compared with those that visit the plantation irrigation reservoirs (4688-4691). Ae'o have also been known to frequent Wahikuli mudflat, and crater and Wahikuli Reservoirs with some regularity. Shallenberger (1977 report) saw 1 in the Wahikuli Area in 1977 (LAHAINA quadrangle) (4692). Shallenberger also reported that Ae'o utilized Waihee marchland (WAILUKU quadrangle) before this area was filled and planted to sugar cane (4886).

More Ae'o have been counted over a longer period of time at Kanaha Pond (WAILUKU quadrangle) than any other single habitat in the Hawaiian Islands. As far as is known, this species has been continuously resident at Kanaha Pond since first observed there by O. Finsch in 1897 and no doubt long before. Members of the Hawaii Audubon Society began recording numbers of Ae'o at Kanaha in 1949 and continued this practice through about 1975, after which this tradition apparently tapered off. Censusing by HDFG began in 1958 and continued with generally increasing frequency until 1981. Counts by USFWS began in 1964, reached peaks in 1970 and 1976 to 1977, after which decreasing frequency was evident. Except for auxiliary information on Ae'o numbers given in terms of running averages or data pertaining to special studies (which will be treated later), data shown in Table 19 represent the combined record of complete counts on Kanaha Pond from 1951 to September 1981. The numbers of Ae'o counted are listed according to breeding or non-breeding seasons (4695-4885). Ae'o present during the period 1951 to 1957 are indicated in the Appendix in terms of relative abundance, hence are not included in Table 19 (4695-4697).

Comparing Grand Averages for monthly periods, and averages for years in which census data are available for each monthly period (1964-1966, 1970, 1973, 1976-1980), it is clear that significantly fewer Ae'o tend to be present at Kanaha in

in January and February than during the breeding (March to July) and post-breeding (August to December) seasons. Though not exhibited in the Grand Average, which appears biased toward lower than normal counts during August to December and higher than average numbers during March to July, there appears to be a higher number of this species present at Kahana in the post-breeding season (August to December) than during the breeding season (March to July). This is perhaps more easily explained by the year's production of young than any general influx of Ae'o into the area, but no clear conclusion can be drawn because of information gaps.

By comparing census data in Table 19 it is possible to learn whether the number of Ae'o utilizing Kanaha in recent years has increased, decreased, or remained stable. While certain gaps exist in count records for some monthly periods, Ae'o were counted during each of the 18 years from 1964 to 1981. Averages for the appropriate monthly and yearly periods are shown in Table 20.

It is clear that on average, significantly fewer of this species were counted on Kanaha from 1973 to 1981 than from 1964 to 1972, some 27 percent fewer, in fact. Decreases were also experienced in each monthly period for the same two groups of years, as follows: January-February (15 percent), March-July (31 percent), August-December (31 percent). Thus, despite gaps in information, decline in numbers of Ae'o counted on Kanaha Pond in recent years appears real.

Census data for Kealia (MAALAEA quadrangle) has been compiled for comparative purposes in a fashion similar to that of Kanaha. However, for Kealia the month of record during March to July and August to December censuses is shown in parenthesis as a possible explanation for wide disparities. The result of censuses by HDFG and cooperators at Kealia, Maui, from 1958 to 1981 are exhibited in Table 21.

Comparing Grand Averages for monthly periods and averages for years in which census data are available for each monthly period (1964-1966, 1969, 1970, 1975-1980), it is clear that significantly fewer Ae'o tended to be present at Kealia (as at Kanaha) in January and February than during the breeding (March to July) and post-breeding (August to December) seasons. There does not seem to be any significant difference, however, between the numbers of Ae'o censused in March to July and August to December periods.

To determine whether the trend in numbers of Ae'o at Kealia is increasing, decreasing, or stable, one needs to

compare the average number counted monthly and yearly during the period 1964 to 1981, as was done for Kanaha. Results are shown in Table 22.

Examination of data in Table 22 reveals that, on average, strikingly more Ae'o were counted on Kealia from 1973 to 1981 than from 1964 to 1972, 233 percent more, in fact (58 vs. 135). Increases are also shown for each monthly period, as follows: January to February (522 percent), March to July (128 percent), August to December (227 percent). Thus, despite gaps in census information (including periods when the area was dry), the increase in numbers of Ae'o counted on Kealia Pond appears real. The increase in numbers found at Kealia from 1973 to 1981 correlates well with the decline experienced at Kanaha from 1973 to 1981. As earlier developed from islandwide count data shown in Table 17, there is no clear indication that numbers censused on Maui in recent years are either increasing or decreasing. When figures of the past 5 years are compared with the previous 5, January to February populations show a 24 percent increase, and July/August numbers exhibit a 33 percent decline.

Productivity

Hanson (1906b) seems to have been the first observer to suspect the nesting of Ae'o at Kanaha when he visited Maui at Easter that year (4705). Nests and/or young Ae'o were noted on a number of occasions during subsequent years, e.g. 3 young and 6 nests on 24 June 1968 by USFWS (4742), 11 immittures on 3 July 1970 by King (4757), and 3 2-egg nests on 5 July 1972 by Berger (4786), among others.

Beginning in 1976, HDFG conducted nest and productivity studies on artificial islands constructed for Ae'o at Kanaha, and reported finding 45 nests (85.6 percent with eggs) with 88 percent hatching success (4808). In 1978, HDFG located 69 nests (80 percent with "complete" clutches of 2 or more eggs) and 78 percent hatching success (88 percent fertility). The average incubation period of 7 nests was 26.1 days (4849). In 1979, HDPG found 103 nests at Kanaha, 88 with "complete" clutches (?2 or mroe eggs) which hatched with 75 percent success (4865). Total number of nests in 1980 were reported variously by HDPG as 47 (4876) and 41 (4879); 35 were recorded with ccomplete clutches and with 93 percent hatching success (94 percent fertility) (4876). Monthly counts of adults ranged from 43 to 215 during the breeding season with 40 juveniles being counted during the 1980 August census.

At Kealia, in contrast to Kanaha, there seems to be limited nesting in spite of substantial numbers observed during

the breeding season (see Table 21, particularly for the period 1976 to 1980). Nests were reported at Kealia in 1972, 1976, and 1978, but the maximum number reported was 9 (in 1976) (4941, 4965, 5010). Several broods were observed in 1979, though no nests were found that year (5021). It is therefore clear that the greatest potential for Ae'o nesting on Mwaï under present conditions is at Kanaha. However, if the USFWS is successful in acquiring and developing the north shore of Kealia, as proposed, the resulting impoundments would quite likely increase nesting by Ae'o substantially (Shallenberger, pers. comm.)

Intra-Island Movement

Sincock (1969) reported 48 Ae'o captured and color dyed at Kanaha during the week of 21 to 20 October 1968, while Anonymous (1969@) mentions 49 banded and dyed there "last week" (29 November 1968) (4744, 4745). While these reports may be confounded, no record apparently exists that any of the marked individuals were subsequently resighted elsewhere on Maui. (Inter-island movements of Ae'o are treated under the heading Historical Status and Distribution in the Archipelago, and in accounts of individual islands where marked birds were resighted.)

Island of Hawai'i

Islandwide Status and Distribution

The earliest evidence of the presence of Ae'o on the island of Hawai'i seems to be that of S. B. Wilson who collected 3 specimens in an unrecorded locality either in 1888, or when he revisited Hawai'i in 1896 (Banko 1979 report) (5076). Professor Collett also may have collected a specimen on the island of Hawai'i ca. 1893 (5077). Henshaw (1902) reported that this species was "slaughtered...usually shot and thrown away...quite exterminated...becoming scarcer and scarcer in all districts" (4,5). Henshaw's general comment no doubt included the coastal wetlands of the Hilo area where he resided for a period of 10 years.

Nearly 60 years elapsed after the 1890's before Ae'o were next reported on the island. The status of this species on the "Big Island" from ca. 1900 to 1961 is thus in doubt.

Hawaii Division of Fish and game conducted islandwide counts of waterbirds, including Ae'o, on the island of Hawai'i from 1958 to 1981. Results of these counts, listed according to one of several census periods, are shown in Table 22a (5036-5075). It is not known, however, which habitats were surveyed

during each of the listed counts. Some year-to-year consistency was presumably maintained, particularly in the latter years.

As indicated in Table 22a, there is no difference between the rounded averages of January and July/August censuses (20 vs. 20). The small difference between the average January count for the period 1958-1970 (18.5) compared with that of 1971-1981 (21.1) is not judged to be significant. Similarly, the average July/August count from 1968 to 1973 (20.3) is practically the same as the average obtained from 1974-1980 (20.0). No fewer than 11 and no more than 27 Ae'o have been counted on the island of Hawai'i from 1963 to 1981. Population stability occurred over a span of 15+ years in spite of environmental change. HDFG reported in 1976 that habitat in most areas continued to deteriorate (5064).

Ae'o are resident on only 2 of 26 possible habitats in some 17 widely scattered quadrangles on the island of Hawai'i, and then only in small numbers as shown in Table 22a. Some 81 counts at Opaepa (MANALAWENA quadrangle) from 1962 to 1980 produced counts ranging from 6 to 25, averaging 14.4 (5158-5243). The average number sighted during the first half number of counts was 15.5, compared with 13.2 seen during the last half number of counts, any cause of the significant 15 percent difference being unknown. One or two nests have been reported only twice. At Aimakapa, some 63 counts from 1942 to 1980 produced a range of 0 to 24 birds present, averaging 7.4 per count (5246-5314). The average number seen during the first half number of counts was 7.9, compared with 6.9 censused during the last half number of counts, any cause of the significant 13 percent difference likewise being unknown. Nesting has not been reported at Aimakapa.

Over the years Ae'o have been seen or reported on the island of Hawai'i at 7 other widely scattered locations: Kahapapa (ANAEHOOMALU), Kiholo (KIHOLLO), Kalolo (KEAHOLE POINT), Kaupulehu (possibly confounded with Huehue) (KAILUA/HUALALAI), Napoopoo (HONAUNAU), Punaluu (PUNALUU), and Waipio Valley (KUKUIHAELE) (5137, 5147, 5148, 5245, 5324, 5325, 5328, 5331, 5345, 5354). As indicated by the nature of the reports or sightings in these 7 habitats, Ae'o are rarely found in areas other than Opaepa or Aimakapa, and then only briefly and in small numbers.

Productivity

As reported above, nesting of Ae'o on the island of Hawai'i has only rarely been recorded, and then only at Opaepa.

Movement

No Ae'o have been marked or banded on Hawai'i, therefore nothing is known of their movements either on or off the island. It seems likely that Ae'o at Opaehuli visit or intermingle on occasion with those at nearby Aiea, and vice versa, but frequency and extent of such possible visits are unknown. Distant and over-water flights probably occur at night.

CHRONOLOGICAL DISTRIBUTION OF RECORDS

Inspection of census data compiled in the Appendix reveals a large number of counts made over the years, the vast majority by HDFS and USFWS personnel on periodic surveys conducted during the 1970's. The chronological distribution of all data is shown by decade in Table 24.

Examination of data in Table 24 reveals a slow increase of information on status and distribution of this species from the 1870's through the 1890's, followed by a sharp decline from the 1900's extending through the 1920's, followed by a second wave of increasing data from the 1930's to the beginning of the 1980's. The gap from 1900's through 1920's has been shown to be characteristic of Hawaiian birds in general.

GEOGRAPHICAL DISTRIBUTION OF RECORDS

If the single record of Ae'o on the island of Lanai is counted, this species is known from 7 of the Hawaiian Islands - Kauai, Ni'ihau, O'ahu, Molokai, Maui and Hawai'i.

On Kauai, Ae'o have historically frequented a broad range of lowland habitats eschewing, for the most part, only the irrigation reservoirs. The area of greatest use centers in the taro fields of Hanalei, in the northeast portion of the island. The second highest ranked group of habitats in terms of usage are those of the wet pastures and settling basin of Kekaha, in southwestern Kauai. The third most heavily used wetlands are those of Grove Farm and Lihue Plantation Settling Basins, in the south-eastern part of the island. Typically, only about a half-dozen or so pairs of Ae'o nest each year on Kauai, characteristically in widely scattered localities with poor success. Most of the breeding population on Kauai move to Ni'ihau upon the onset of the nesting season where large shallow lakes resulting from winter rains usually provide a favorable environment for nesting and rearing of young.

Little is known of Ae'o habits and distribution on Ni'ihau,

a privately-owned island. Counts during the breeding season in 1964 and 1972 found 300 to 400 Ae'o present on each of 2 ponds. Most use, as determined from January and July/ August censuses, centers on Puuwai Pond(s) and Halulu Lake and ditches. Secondary use is made of Puu Alala Pond(s), Nonopapa Lake, and Kiekie Pond(s). Scattered use is also made of some 8 other areas.

Ae'o are found on O'ahu in greater numbers throughout the year and are more broadly distributed than on any other island. Roughly half of the total population in the Islands utilize a multiplicity of habitats in the Pearl Harbor area on seasonal basis including 2 units of the Pearl Harbor National Wildlife Refuge. Outside of these principal habitats, Ae'o have historically patronized some 45 other widely scattered wetland areas on O'ahu.

While nesting has been reported from a number of areas in years past some breeding grounds have since disappeared. Ae'o now appear to breed regularly in substantial numbers only on KCMAS, where possibly as many as 51 nests were located one recent season, and on the Pearl Harbor and James Campbell National Wildlife Refuges. Nesting success and survival of young on O'ahu appears to be poor most years.

Moloka'i is characterized by scattered marginal habitats. The greatest total number of Ae'o resulting from an islandwide count was 32, tallied during a July/August 1979 census. The Kaunakakai pier and sewage pond areas seemed to attract and hold the majority of Ae'o on the island during the 1970's and very early 1980's, as many as 35 being counted there in 1978. In addition, small numbers of Ae'o have been recorded at some 12 or 13 other tidal ponds and wetlands scattered along the leeward coast of Moloka'i. Recent development of habitat at Kakahaia National Wildlife Refuge is attracting a small but increasing number of birds. A single observation of Ae'o nesting at Palaau in 1907 remains the only historical record of breeding by this species on Moloka'i.

There being no wetland habitat on Lana'i, the sole record of Ae'o on the island is of a pair which touched down briefly on the puddle-strewn runway of Lana'i Airport on 1 June 1980 before taking off again on inter-island flight.

The historical distribution of Ae'o on Maui has been limited largely to Kanaha Pond on the windward side, Kealia Pond (when flooded) on the leeward coast and, to a much lesser degree, scattered coastal wetlands and irrigation reservoirs on windward plantations which are occasionally visited for brief periods.

On the island of Hawai'i nothing is known of the relative abundance and distribution of Ae'o on the 1890's. Since 1961, when periodic censuses were initiated, this species have been found regularly only at Opaeula and Aieakapa Ponds roughly 8 miles apart on the Kona Coast, and then only in small numbers averaging 14 and 7 respectively. Only occasionally have Ae'o been observed or reported at 6 other marginal habitats on both windward and leeward (Kona) coasts.

SUMMARY AND CONCLUSIONS

The Ae'o or Hawaiian (Black-necked) Stilt (Hymantopus mexicanus knudseni), is a slim black and white wading bird with a long black bill. Closely related to the Black-necked stilt of North America (Himantopus mexicanus mexicanus) the Ae'o was first described in 1888 from specimens collected by V. Knudsen on the island of Kaua'i. Resident populations exist on all 5 major Hawaiian Islands - Kaua'i, O'ahu, Moloka'i, Maui, Hawai'i, and on Ni'ihau where winter rains normally result in large, temporary, shallow ponds. A total of 55 specimens are known to exist worldwide in some 14 widely-scattered museums.

Naturalists before 1900 recorded the Ae'o as common to abundant, though declining, in shallow ponds or tidal flats on all of the larger islands except Hawai'i. After 1903 there is a nearly absolute 30 year gap of information on relative abundance and distribution of the species.

In the 1930's and 1940's members of the Hawaii Audubon Society began recording numbers of Ae'o seen in conspicuous habitats. An official game-bird survey in 1946 and 1947 resulted in the first Statewide population estimate of approximately 1,000 birds. The majority of the 5,400-plus species occurrence records listed in the Appendix are the result of comprehensive Statewide counts initiated by HDFG in 1958, and supplementary censuses of selected areas by USFWS since 1965. Much population data thus exists but variability inherent in observer recording over a long period of time, and other factors, qualify conclusions which might otherwise be drawn by detailed comparative analysis.

Numbers and distribution of Ae'o at any given hour of the day or season of the year is highly dependent upon the quantity and location of often temporarily flooded pastures, settling basins and tidal wetlands. Tidal conditions, rainfall, and land-use patterns thus play key roles in determining relative abundance and distribution of this species Statewide. Daily movement tends to be local and frequent, especially in tidal

environments. Long-distance and inter-island flights during the pre and post breeding seasons are less frequent and apparently made at night.

Seasonal distribution and population trends for individual islands are summarized in Table 25. Data in Table 25 are somewhat qualified and conclusions therefore conditional.

Kaua'i

Year-round use of Kaua'i by Ae'o, as measured by periodic censusing in January and July/August, has increased dramatically since regular record-keeping began in 1956. Population averages (in parenthesis) for the following groups of years indicate the population censused for each count period, as follows: January: 1956-1967 (14), 1968-1976 (48), 1977-1981 (146), and for July/August: 1956-1967 (no data), 1968-1973 (92), 1974-1981 (283). About twice as many Ae'o are found on Kaua'i during the summer months as during the winter, presumably reflecting return of post-breeding population with young from Ni'ihau.

Use of habitats on Kaua'i appears to be undergoing long-term change. In recent years when average numbers of Ae'o censused in some 54 habitats are compared, increasing use is apparent in the Kekaha, Mana, and Lihue areas, and decreasing in the Hanalei, Waipa, and Waioli wetlands. Long-term Ae'o use of less important or marginal habitats appears to be declining. At least 2 significant habitats have been lost, e.g. near Waimea and lagoons in Kekaha. The vast majority of Ae'o on Kaua'i utilize habitats that are agriculturally intensive, i.e., settling basins, taro fields, wet pastures; by contrast, most reservoirs receive little or no use. Breeding on Kaua'i is scattered and sparse. Apparently less than 10 pairs nest annually islandwide, typically with poor success and survival of young.

Ni'ihau

Long-term census data for Ni'ihau are lacking, however it appears from aerial counts that numbers of Ae'o using that island have declined in recent years, as follows: January: 1968-1974 (no data), 1975-1981 (135); July/August: 1968-1973 (81), 1974-1980 (40). Rainfall patterns are no doubt an influential factor. In recent years January population levels have, on average, exceeded those present in July/August by a factor of 3x. The January figure indicates the size of the pre-breeding season population while the July/August count represents those remaining during the season of general exodus.

The 1964 report that 300 to 400 Ae'o were present "on each of two ponds", and a 12 April 1972 census of 360, suggests that from one-third to more than three-quarters of the total population of this species Statewide may converge on Ni'ihau during favorable breeding seasons.

O'ahu

Long-term census data for O'ahu indicates relative population stability, as follows: January: 1956-1961 (330), 1962-1967 (275), 1968-1974 (283), 1975-1981 (315); July/August: 1956-1961 (no data), 1962-1967 (no data), 1968-1974 (536), 1975-1981 (486).

Trends in use of major habitats by this species are mixed. Usage is plainly increasing on Federal management units (Pearl Harbor NWR, James Campbell NWR, KMCAS), while numbers are decreasing in the Pearl Harbor complex (outside NWR's), Keehi Lagoon, and a majority of unmanaged widely scattered wetlands.

At least 5 habitats of major importance to Ae'o have been lost since the 1930's: Kaelepulu, Kuapa, Salt Lake, and Moanalua-Mapunapuna-Kalihi Flats.

Pre-breeding exodus and post-breeding influx islandwide is plainly indicated. Kaneohe Marine Corp Air Station (Nuupia Pond) has been a popular breeding habitat in recent years, with nesting becoming increasingly significant on the Pearl Harbor and James Campbell National Wildlife Refuges.

Nesting success and survival of young on O'ahu appears to be poor.

Moloka'i

Considering the small numbers of Ae'o, and apparent variation in survey coverage of scattered habitats, the use of Moloka'i by this species appears to be relatively stable long-term, as follows: January: 1960-1964 (9), 1976-1981 (12); July/August: 1958-1972 (no data), 1973-1980 (19). There appears to be a significant pre-breeding exodus and post-breeding influx of Ae'o on Moloka'i. Nesting has been reported only once (in 1907). Habitat development at Kakahaia NWR is attracting a small but increasing population of Ae'o.

Maui

Ae'o on Maui exhibit much the same degree of long-term

stability as on O'ahu, albeit with fewer numbers, as indicated by the following census data: January: 1957-1961 (189), 1962-1966 (206), 1967-1970 (198), 1970-1975 (no data), 1976-1981 (259); July/August: 1957-1961 (no data), 1962-1967 (no data), 1968-1971 (487), 1972-1974 (no data), 1975-1980 (238). Average counts in January and July/August have been roughly the same in recent years (259 vs. 238 respectively). Indications of extensive pre- and post-breeding movements off the island are lacking.

Distribution of Ae'o on Maui is limited largely to Kanaha Pond, and Kealia when flooded. Scattered irrigation reservoirs in the central valley are visited occasionally by small numbers. Kanaha is a major Ae'o breeding area some years, over 100 nests having been counted there in a single season. Nesting success and survival of young appears to be significantly higher on Kanaha than on breeding grounds of O'ahu or Kaua'i.

Hawai'i

A low population of Ae'o on Hawai'i (ca. 20) exhibits long-term stability, as follows: January: 1958-1967 (13), 1968-1974 (28), 1975-1981 (19); July/August: 1958-1967 (no data), 1968-1974 (21), 1975-1980 (20). Except for the higher than average January count from 1968 to 1974, relative by uniform counts during both pre- and post-breeding seasons prevail. Resident populations are limited to Opaepa and Aumakapa Ponds on the central Kona Coast. Other habitats appear to be visited only infrequently. Breeding is apparently rare on the island of Hawai'i, only 1 or 2 nests having been reported over the years, and then only on Opaepa.

Statewide Population Status

The total number of Ae'o counted Statewide in January and July/August censuses during recent years is summarized by island in Table 26.

Data in Table 26 exhibits extent of the pre-breeding movement of Ae'o in January to Ni'ihau and, possibly to a lesser extent to Maui, and post-breeding return with young to Kaua'i, O'ahu, and Moloka'i in July/August. About 900 Ae'o have composed the pre-breeding population the past few years, while some 1,100 have been evident at the conclusion of nesting during the same period. Production of around 200 young per year appears to be matched by mortality of similar scale. The Ae'o population is thus comparatively stable long-term.

Table 1.

Ae'o Recorded by HDFG on Statewide Waterbird Surveys,
1956-1981

<u>Year</u>	<u>January</u>	<u>Islands*</u>	<u>July/August</u>	<u>Islands*</u>
1956	338	unrecorded		
1957	468	unrecorded		
1958-1962		unrecorded		
1963	556	Ka, Oa, Mo, Ma, Ha		
1964	734	Ka, Oa, Mo, Ma, Ha		
1965	391	Ka, Oa, Ma, Ha		
1966	530	Ka, Oa, Mo, Ma, Ha		
1967	436	Ka, Oa, Mo, Ma, Ha		
1968	448	Ka, Oa, Mo, Ha	1,287	Ka, Oa, Na, Na
1969	417	Ka, Oa, Mo, Ma, Ha	1,513	Ka, Ni, Oa, Mo, Ma, Ha
1970		unrecorded	1,187	Ka, Ni, Oa, Mo, Ma, Ha
1971		unrecorded	934	Ka, Ni, Oa, Mo, Ma, Ha
1972-1973		unrecorded	unrecorded	
1974		unrecorded	1,215	
(?Ka, Ni, Oa, Mo, Ma, Ha)				
1975		unrecorded	unrecorded	
1976		unrecorded	1,478 (?1,476)	
(?Ka, Ni, Oa, Mo, Ma, Ha)				
1977	1,161 (?1,151)	Ka, Ni, Oa, Mo, Ma, Ha	1,090	Ka, Ni, Oa, Mo, Ma, Ha
1978	890	Ka, Ni, Oa, Mo, Ma, Ha	975	Ka, Ni, Oa, Mo, Ma, Ha
1979	523	Ka, Ni, Oa, Mo, Ma, Ha	1,276	Ka, Ni, Oa, Mo, Ma, Ha
1980	881	Ka, Ni, Oa, Mo, Ma, Ha	1,012	Ka, Ni, Oa, Mo, Ma, Ha
1981	1,185	Ka, Ni, Oa, Mo, Ma, Ha		

*Legend: Ka = Kauai, Ni = Niihau, Oa = Oahu,
Mo = Molokai, Ma = Maui, Ha = Hawaii

Table 2.

Comparison of Ae'o Census Results, 1956-1981

Legend: A = Differences between successive years (January census)
 B = Percent change between successive years (January census)
 C = Differences between successive years (July/August census)
 D = Percent change between successive years (July/August census)
 E = Differences between January and July/August censuses
 F = Percent change from January to July/August census
 G = Differences between July/August and following January censuses
 H = percent change between July/August and following January censuses

<u>Year</u>	<u>January census</u>	<u>A.</u>	<u>B.</u>	<u>July/Aug. census</u>	<u>C.</u>	<u>D.</u>	<u>E.</u>	<u>F.</u>
1956	338							
1957	468	+130	+38%					
1963	556							
1964	734	+178	+32%					
1965	391	-343	-47%					
1966	530	-139	+36%					
1967	436	- 94	-18%					
1968	448	+ 12	+ 3%	1,287			+ 839	+187%
1969	417	- 31	- 7%	1,513	+226	+18%	+1,096	+263%
1970				1,187	-326	-22%		
1971				934	-253	-21%		
1974				1,215	+281	+30%		
1976				1,478				
1977	1,161			1,090	-388	-26%	- 71*	- 06%
1978	890	-271	-23%	975	-115	-11%	+ 85	+ 10%
1979	523	-367	-41%	1,276	+301	+31%	+753	+144%
1980	881	+358	+68%	1,012	-264	-21%	+131	+ 15%
1981	1,185	+304	+35%					

Range 338-1185

934-1513

14-year Ave. 640

10-year Ave. 1197

Ave. 1st. 9 years 480

Ave. 1st. 6 years 1269

Ave. last 5 years 928

Ave. last 4 years 1088

* Decrease may reflect low breeding success due to dry Spring and Summer

Table 3.
Ae'o Recorded By HDFG Censuses On Kauai 1956-1981

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1956	3		
1957	6		
1958	0		
1959	12		
1960	14		
1961	8		
1962	0		
1963	19		
1964	55		
1965	18		
1966	7		
1967	20		
1968	9	92	
1969	49	109	
1970	12	54	

Table 3 (con't)

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1971-1972			<p>1 July 1971-30 June 1972...Counts this year (including 78 on 27 July, 120 on 30 July, 47 on 12 April) ranged between 21 and 145... peaked in November and bottomed in February...fluctuations attributable to seasonal migration encouraged by lack of suitable nesting habitat on Kauai, flooding on Kauai which reduces size of feeding areas, improved habitat on Niihau as winter rains reflood dry lake beds, competition with migratory waterfowl on Kauai...</p>
1972-1973			<p>1 July 1972-30 June 1973...quarterly census totals ranged between 74 and 108...Seasonal populations all above average except for fall...high count occurred in the fall and low count during the winter ...range this year not nearly so great as usual... ponds on Niihau were dry...presumably the majority remained on Kauai where there is more permanent open water...in analyzing population dynamics it is difficult to separate movement from productivity ...distribution on Kauai is dependent mostly on water levels in various habitat areas...11 of 19 are temporary and provide for no all-year use, 14 of 19 are man-made and subject to wide fluctuations in water level and human disturbance...freshly flooded areas are most attractive because they provide a temporary new supply of invertibrates that are washed in for food...several stilts observed trapping schools of mosquito fish in Mana Base Pond...one caught 5 within a minute...most fresh water habitats support abundant supplies of these introduced fish...temporary habitats such as sugar plantation settling basins provide artificial feeding areas... stilt often feed around water delivery pipes which</p>

Table 3 (con't)

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
			<p>carry insects, larvae and worms washed off the sugar cane into the settling basin...dependence of stilts on these man-made habitats is great as the greatest limiting factor of populations on Kauai is the shortage of natural open shallow water areas with depths less than 6 inches...</p>
1973	122		
1973-1974			<p>1 July 1973-30 June 1974... Populations ranged between 0 and 120 during the quarterly censuses this year...high counts during the summer and low numbers during the winter...atypical because stilt usually peak during the fall...4-year record of monthly rainfall and quarterly stilt population data collected on Kauai between July 1970 and June 1974 shows a noticeable correlation between the Kauai stilt population and monthly rainfall...stilt populations of Kauai invariably decrease soon after heavy winter rains commence...</p>
1976	117	372	<p>1 July 1975-30 June 1976... Comprehensive censuses conducted in August and January...record numbers...were counted during the summer survey...partly as a result of the increase in the number of habitats surveyed, but also apparently, because of an exceptional year of productivity...the normal migration of stilt from Kauai to Niihau was delayed this year, possibly because of the late advent of winter Kona storms which are believed to be the stimulus that initiates their movement...In most years, a majority of the stilt moved to Niihau during the fall months with the first heavy Kona storms...</p>

Table 3 (con't)

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u> Kauai did not receive its first true Kona storm until after the winter census this year. By this observation it is probable that these storms are the stimulus which initiate movement of stilt from Kauai to Niihau...
1977	318	326	1 July 1976-30 June 1977...lack of heavy kona storms this winter resulted in there being negligible migration of stilts from Kauai to Niihau...severe water drought resulted in concentration of stilts in record numbers on Kauai
1978	173		1 July 1977-30 June 1978...Sharp decrease in numbers censused is attributed to severe drought in 1977, and consequent lack of sufficient productivity to offset annual mortality...many that normally migrate to Niihau remained on Kauai for the second winter in a row...
1979	21	346	...a particularly poor nesting season...no nests found at Lihue Plantation, Grove Farm, and Kekaha Sugar Co. settling basins...open mudflat habitat noticeably lacking on Kauai...
1980	103	116	...of 93 classified by age, only 4 percent were judged to be immature birds...
1981	117		

Table 4.

Summary of Ae'o Censused By Quadrangle, 1961 to 1982,
Island of Kaua'i

<u>Quadrangle</u>	<u>Total No. Counted</u>	<u>Total No. Counts</u>	<u>Ave. No. Per Count</u>	<u>Total No. Habitats</u>
MAKAHA POINT	0	29	0	2
HAENA	2	17	.12	2
HANALET	1608	170	9.46	15
ANAHOLA	0	124	0	13
KEKAHA	1239	238	5.21	14
WAIMA CANYON	0	1	0	1
WAIALEALE	0	0	0	0
KAPAA	35	258	.14	25
HANAPEPE	356	313	1.14	30
KOLOA	400	393	1.02	31
LIHUE	993	200	4.97	12
Total	4633	1743	2.66	145

Table 5.

Ae'o Censused In 11 Quadrangles, 145 Habitats,
Island of Kauai, 1961-1982

<u>Quadrangle & Habitat</u>	<u>Serial No's</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>	<u>Ave.No. Counted 1st Half Period</u>	<u>Ave.No. Counted 2nd Half Period</u>
MAKAHA POINT							
Kolo Reservoir	137-151	0	15		1974-1981		
Saki Mana Res.	152-165	0	14		1974-1980		
HAENA							
Haena Pond	166-167	0	2		1968-1977		
Wainiha T/R Fields	168-182	2	15	.13	1968-1982	0	.13
Waihiha Valley	183 (see Table 6)						
HANALEI							
Hanalei Valley	184-193 (see Table 6)						
Hanalei R. Estuary	194-198	2	5	.4	1968-1975	.8	0
Hanalei NWR	199-219 (see Table 6)						
Hanalei NWR Lookout	220-230	534	10	53.40	1961-1980	55.40	51.40
Hanalei NWR F/F	231-240	231	10	24.10	1975-1980	24.80	21.40
Hanalei Taro Fields	241-265	313	24	13.04	1968-1975	13.58	12.50
Hanalei P.O. Taro	266-276	110	10	11.00	1975-1980	10.04	11.6
Hanalei Trader Taro	277-285	35	9	3.88	1975-1980	6.11	1.66
Kalihiwai R/Estuary	286-301	0	16				
Lower Hanalei River	302-312	0	11				
Kalihiwai Res.	313-322	0	10				
Kalihiwai Prawn Farm	323	0	1				
Lumahai River	324-339	55	16	3.44	1968-1980	6.13	.75
Lumahai Valley	340-344 (see Table 6)						
Princeville G/C Ponds	345-354	0	10				
Waioli Taro Fields	355-364	217	10	21.70	1975-1980	28.20	15.20
Waipa Taro Fields	365-378	107	14	7.64	1974-1980	9.71	5.57
Wilcox Ponds	379-392	4	14	.29	1974-1980	0	.57
ANAHOLA							
Anahola Estuary	393-402	0	10		1975-1981		

Table 5 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No's</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>	<u>Ave.No. Counted 1st Half Period</u>	<u>Ave.No. Counted 2nd Half Period</u>
Anahola Valley	403 (see Table 6)						
Kaloko Reservoir	404-417	0	14		1974-1980		
Kaloko Prawn Farm	418	0	1		1978		
Kamoku Pastures	419-428	0	10		1975-1980		
Kaneha Reservoir	429-438	0	10		1975-1980		
Kanehu Res. #1	439-446	0	8		1975-1980		
Kanehu Res. #2	447-456	0	10		1975-1981		
Kanehu Res. #3	157-166	0	10		1975-1981		
Kilauea Estuary	467-480	0	14		1974-1981		
Mimino Reservoir	481-482	0	2		1975-1976		
Morita Reservoir	483-494	0	12		1968-1980		
Puu Ka Ele Res.	495-504	0	10		1975-1980		
Waiakalua Res.	505-517	0	13		1974-1979		
KEKAHA							
Kekaha	518-521 (see Table 6)						
Kekaha Pasture	522-554	408	32	12.75	1970-1980	10.68	14.81
Kekaha S. Basin	555-579	467	25	18.68	1969-1980	9.04	28.32
Kekaha S.H. Res.	580-603	70	24	2.90	1969-1980	3.08	2.75
Kahelunui Res.	604-618	0	15		1974-1981		
Mana Ponds	619-641	76	18	4.22	1963-1974	1.78	6.67
Mana Base Pond	642-678	107	30	3.56	1973-1980	3.20	3.93
Mana Brackish Pond	679-704	34	23	1.48	1974-1980	1.39	1.56
Mana Ditches	705-709 (See Table 6)						
Mana House Res.	710-723	5	14	.36	1974-1980	.43	.29
Mana Pastures	724-728	64	4	16.00	1969-1973	19.50	12.50
Mana Res.	729-744	0	16		1969-1981		
Niu Valley Res.	745-753	1	9	.10	1976-1980	.11	.11
Waiawa Res.	754-767	7	13	.54	1974-1980	1.00	0
Wailau Siphon Res.	768-773	0	6		1976-1980		
Waimea Hts. Res.	774-782	0	9		1975-1980		
WAIMEA CANYON							
Hepani Res.	783	0	1		1981		

Table 5 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No's</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>	<u>Ave.No. Counted 1st Half Period</u>	<u>Ave.No. Counted 2nd Half Period</u>
KAPAA							
Aii Res.	784-79S	0	12		1975-1981		
DeMello Res.	796-806	0	11		1975-1981		
Fern Grotto Res.	807-816	0	10		1975-1981		
Halaula Res.	817-824	0	8		1975-1980		
Hanahanapuni Res.	825-834	2	10	.20	1975-1981	.40	0
Hanamaulu Res.	835-848	4	14	.29		.57	0
Hanamaulu F/S Res.	849-856	0	8		1975-1981		
Kailiiliahinale Res.	857-866	0	10		1975-1980		
Kapaa Stable Res.	867-875	0	9		1975-1980		
Kapaa Stream Est.	876-886	0	11		1975-1981		
Kapahi Pastures	887-893	0	7		1976-1980		
Kapaia Res.	894-903	0	10		1975-1980		
Lono Res.	904-913	0	10		1975-1981		
Moikeha Canal	914-923	0	10		1975-1981		
Moikeha Res.	924	0	1		1976		
Opaekaa Valley	925-941	22	17	1.29	1968-1980	.29	2.29
Paradise Pacifica	942-952	2	11	.18	1975-1980	.36	0
Pukaki Res.	953-96E	2	10	.20	1975-1981	0	.40
Rodriques Res.	963-973	0	11		1975-1981		
Sloggett Res.	974-991	3	18	.17	1969-1980	3.33	0
Twin Reservoirs	992-1002	0	11		1975-1981		
Waikaea Canal	1003-1013	0	11		1975-1981		
Wailua Golf Course	1014-1024	0	11		1975-1981		
Wailua H. Pastures	1025-1030	0	6		1976-1980		
Wailua J. Swamp	1031-1041	0	11		1975-1981		
HANAPEPE							
Aaka Reservoir	1042-1048	0	7		1975-1981		
Alexander Res.	1049-1056	0	8		1975-1981		
Ekahi Res.	1057-1062	0	6		1975-1981		

Table 5 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No's</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>	<u>Ave.No. Counted 1st Half Period</u>	<u>Ave.No. Counted 2nd Half Period</u>
Elima Res.	1063-1072	0	10		1975-1981		
Elua Res.	1073-1082	0	10		1975-1980		
Hanapepe S. Pond	1083-1123	199	40	4.98	1964-1980	7.28	2.15
Hanapepe T. Fields	1124-1136	8	13	.61	1968-1980	.92	.31
Hukiwai Res.	1137-1146	0	10		1975-1980		
Ioleau Res.	1147-1156	0	11		1976-1981		
Kaawanui Res.	1957-1167	1	7	.14	1975-1979	0	.29
Kalaeloa Res.	1175-1181	0	7		1975-1979		
Kalaheo G. Res.	1182-1183	(see Table 6)					
Kapa Res.	1184-1193	0	10		1975-1980		
Kaumakahi G.	1194-1206	41	13	3.15	1969-1979	5.85	.46
Kiaha Res.	1207-1217	0	11		1975-1981		
Maele Res.	1218-1227	0	10		1976-1981		
Manieniula Res.	1228-1237	39	10	3.90	1975-1980	6.40	1.40
Mau Res.	1238-1247	0	10		1975-1980		
Nomilo Fish Pond	1248-1257	1	10	.10	1976-1981	.20	0
Nonopahu Res.	1258-1266	2	9	.22	1975-1981	.44	0
Olokele S. Basin	1267-1284	17	18	.94	1968-1981	1.89	0
Poopupueo Res.	1285-1293	0	9		1975-1980		
Pulani Res.	1294-1300	1	7	.14	1975-1978	0	.29
Puu O Papai Res.	1301-1311	36	11	3.27	1975-1981	4.55	2.00
Umi Res.	1312-1322	0	11		1975-1981		
Wahiawa B. Res.	1323-1331	0	9		1976-1980		
Wahiawa Mudflats	1332	0	1		1968		
Waikai Res.	1333-1340	0	8		1975-1981		
Waikoloa Res.	1341-1348	0	8		1975-1981		
Waimea T. Fields	1349-1357	11	9		1975-1980	2.00	.44
Waimea (Village)	1358-1359	(see Table 6)					
KOLOA							
Aepo Res.	1360-1369	0	10		1975-1980		
Aepoalua Res.	1370-1378	0	9		1975-1980		
Aepoeha Res.	1379-1388	0	10		1975-1980		

Table 5 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No's</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>	<u>Ave.No. Counted 1st Half Period</u>	<u>Ave.No. Counted 2nd Half Period</u>
Apeokolu Res.	1389-1398	0	10		1975-1980		
G.F.S. Basin	1399-1414	167	16	10.44	1975-1980	2.5	18.38
G.F.T. Pile	1415-1436	15	21	.71	1972-1980	1.05	.38
Halenanahu Res.	1437-1449	0	13	.54	1974-1980	.31	.77
Nanini Res.	1450-1459	0	10		1975-1980		
Huinawai Res.	1460-1469	0	10		1975-1980		
Kaupale Res.	1470-1480	0	11		1975-1980		
Kipu Res. #1	1481-1496	0	16		1974-1980		
Kipu Res. #2	1497-1512	2	16	.13	1974-1980	0	.25
Kipu Res. #3	1513-1529	6	17	.36	1974-1980	.47	.24
Kipu Road Res.	1530-1540	0	11		1975-1981		
Koloakaapohu Res.	1541-1551	0	11		1969-1980		
Kumao Res.	1552-1563	0	12		1969-1981		
Lawai Kai Estuary	1564-1570	0	7		1975-1980		
Loko Res.	1571-1579	0	9		1975-1980		
Luawai Res.	1580-1588	0	9		1976-1981		
Mahalepu Ponds	1589-1602	4	14		1974-1980		
Manuhonuhonu	1603-1613	0	11		1975-1981		
Mauka Res.	1614-1630	6	17	.35	1968-1980	.35	.35
Omao Res.	1631-1640	0	10		1975-1980		
Papuaa Res.	1641-1653	0	13		1974-1980		
Pia Mill Res.	1654-1664	0	11		1975-1980		
Pinau Res.	1665-1676	0	12		1975-1981		
Piwai Res.	1677-1684	0	8		1975-1981		
Poipu Ponds	1685-1697	0	12		1968-1981		
Puuhii Res.	1698-1710	14	13	1.08	1974-1980	.23	1.69
Puu O Hewa Res.	1711-1721	5	11	.45	1975-1980	.91	0
Waita Res.	1722-1756	174	33	5.27	1966-1980	4.96	5.58
LIHUE							
Ahukini Res.	1757-1794	204	37	3.58	1968-1980	8.05	2.97
Aweoweohui Valley	1795-1817	15	23	.65	1968-1980	1.13	.17
Halehaka Res.	1818-1828	0	11		1975-1981		

Table 5 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No's</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>	<u>Ave.No. Counted 1st Half Period</u>	<u>Ave.No. Counted 2nd Half Period</u>
Huleia NWR	1829-1847	6	19	.32	1974-1982	.63	0
Huleia Valley	1848 (see Table 6)						
Kauai G. C. Ponds	1849-1858	0	10		1975-1981		
Kauai Surf H. Ponds	1859-1867	0	10		1975-1981		
Kipu Res. #4	1868-1884	21	15	1.4	1974-1980	1.4	1.4
Lihue Cane T. Pile	1885-1888	4	4	1.0	1974-1975	0	2.0
Lihue Pl. S. Basin	1889-1938	742	46	16.13	1967-1980	15.74	16.52
Menehune F. Pond	1939-1954	0	16		1969-1980		
Niumalu Flats	1955-1956	0	2		1978-1980		
Waikaia Res.	1957-1964	1	8	.13	1975-1980	0	.25
Total...		4633	1743	2.66			

Table 6.

Essentially Non-tabular Information on Relative
Abundance of Ae'o Observed in 10 Habitats

<u>Quadrangle & Habitat</u>	<u>Serial No.s</u>	<u>Summary</u>	
HAENA			
Wainiha Valley	183	Shallenberger: Max. of 14 seen on 20 May and 22 July...widely distributed...no more than 2 noted on earlier counts...numbers probably vary considerably with condition of taro fields...presumably some movement of birds between this Valley and more extensive habitat in Wanalei Valley. . .	
HANAIEI			
Hanalei Valley	184-193	6-24 (ave. 12.33) reported in 3 counts 1959-1966 vs. 2-26 (ave. 12.75) reported in 4 counts 1969-1973	51
Hanalei NWR	199-219	0-34 (ave. 15.75) reported in 4 counts 1974-1976 vs. 57 ave. daily use Oct. - Dec. 1979, 38.75 ave. daily use 1980, 35.33 ave. daily use Jan.- Sep. 1981, 8.25 ave. daily use Feb.-June 1982	
Lumahai Valley	340-344	Shallenberger: 2 on 20 May...appears on only 1 of 46 USFWS counts in recent years...counts during periods of low tide probably have resulted in greater numbers	
ANAHOLA			
Anahola Valley	403	Shallenberger: 0 seen on 2 surveys...likely visit temporarily flooded pastures and taro fields in upper Valley	
KEKAHA			
Kekaha	518-521	reported abundant in lagoons in 1893; 0-10 (ave. 6.33) seen in area in 3 counts 1961-1963	

Table 6 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No.s</u>	<u>Summary</u>	
Nama Ditches	705-709	up to 6 used regularly 1963-1966...nest found 1967... 0 seen on 3 censuses 1978-1980	
HANAPEPE			
Nalaheo G. Res.	1182-1183	Shallenberger: max. of 4 seen on all ponds in 2 visits (1977)	5
Waimea (village)		1358-1359 hundreds of stilts reported and several specimens collected in 1890's	
LIHUE			
Huleia Valley	1848	Shallenberger: recorded irregularly in small numbers at the fishpond and in flooded pastures upstream	

Table 7.

10 Highest Ranked Ae'o Habitats Showing Degree
of Use Recorded During Various Census Periods

<u>Quadrangle & Habitat</u>	<u>Ave. No. Counted</u>	<u>Total No. of Counts</u>	<u>Census Period</u>
HANAIEI			
Hanalei Taro Fields	13.04	24	1968-1975
Hanalei P.O. Taro Fields	11.00	10	1975-1980
Hanalei NWR Lookout	53.40	10	1975-1980
Hanalei NWR F/F	24.10	10	1975-1980
Waioli Taro Fields	21.70	10	1975-1980
KEKAHA			
Kekaha Pasture	12.75	32	1970-1980
Kekaha Settling Basin	18.68	25	1969-1980
Mana Pastures	16.00	64	1969-1973
KOLOA			
G.F.S. Basin	10.44	16	1975-1980
LIHUE			
Lihue Pl. Settling Basin	<u>16.13</u>	<u>46</u>	1967-1980
Totals...	197.24	247	
Average...	19.72	24.7	

Table 8

17 Medium Ranked Ae'o Habitats Showing
Degree of Use Recorded During Various Census Periods

<u>Quadrangle & Habitat</u>	<u>Ave. No. Counted</u>	<u>Total No. of Counts</u>	<u>Census Period</u>
HANAIEI			
Waipa Taro Fields	7.64	14	1974-1980
Hanalei Trader Taro	3.88	9	1975-1980
Lumahai River	3.44	16	1968-1980
KEKAHA			
Mana Ponds	4.22	18	1963-1980
Mana Base Pond	3.56	30	1973-1980
Kekaha S.H. Res.	2.90	24	1969-1980
Mana Brackish Pond	1.48	23	1974-1980
KAPAA			
Opaekaa Valley	1.29	17	1968-1980
HANAPEPE			
Hanapepe Salt Pond	4.98	40	1964-1980
Nanieniula Res.	3.90	10	1975-1980
Puu O Papai Res.	3.27	11	1975-1981
Kaumakani Gulch	3.15	13	1969-1980
KOLOA			
Waita Res.	5.27	33	1966-1980
Puuhi Res .	1.08	13	1974-1980
LIHUE			
Ahukini Res.	3.58	37	1968-1980
Kipu Res. #4	1.4	15	1974-1980
Lihue Cane T.P.	1.0	4	1974-1975

Table 9.

Ae'o Recorded by HDFG Aerial Waterbird Counts
On Ni'ihau 1968-1981

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Source</u>
1968		50-70	(1)
1969		155	(1)
1970		128	(1)
1971		42	(1)
1972		101	(8)
1973		0 (dry)	(1)
1974		51	(8)
1975	135	37	(8)
1976	174	25	(2)
1977	44	31	(2)
1978	139		(2)
1979	113	14	(5)
1980		34	(5)
1981	203		(5)

Table 10.

Ae'o Censused in 12 Habitats, Ni'ihau, 1947-1980

<u>Habitat</u>	<u>Serial No's.</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Census Period</u>
Naao Reservoir	1997-1998	13	2	6.5	1976-1977
Halalii Lake & Ditches	1999-2008	62	10	6.2	1947-1980
Halulu Lake & Ditches	2009-2017	271	9	30.1	1972-1978
Kaalialinui Valley	2018	0	1	0	1979
Kaumuhonu Reservoir	2019	4	1	4	1980
Kaununu Reservoir	2020	32	1	32	1972
Keanauhi Reservoir	2021-2025	25	5	5	1972-1980
Kiekie Pond(s)	2026-2031	69	6	11.5	1947-1978
Nonopapa Lake	2032-2039	103	8	12.8	1972-1980
Palikoe Pond	2040	0	1	0	1978
Pohueloa Reservoir	2041-2045	31	5	6.2	1972-1980
Puu Alala Pond(s)	2046-2050	79	5	15.8	1972-1980
Puuwai Pond(s)	2051-2054	246	6	41.0	1947-1979

Table 11.

Ae'o Recorded by HDFG on O'ahu Waterbird Surveys 1956-1981

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1956	163		
1957	272		
1958	549		
1959	533		
1960	no census		
1961	134		
1962	175		
1963	356		
1964	485		
1965	184		
1966	242		
1967	209		
1968	175	565	
1969	162	785	
1970	322	491	
1971	362	369	
1972	342		114 (12 April)
1973	509	469	
1974	107		
1975	110	507	
1976	249	231	
1977	439	570	
1978	396		
1979	211	533	
1980	384	588	
1981	418		
Average...300	 511	

Table 12.

Censuses of 300 or More Ae'o in Pearl Harbor
Habitat Complex, 1944-1981

<u>No. Censused</u>	<u>Date</u>	<u>Appendix Serial No.</u>	<u>Source</u>
304	27 Sep. 1953	2117	HATG53a
300+	25 Oct. 1953	2118	GOSG53
304	22 Aug. 1954	2207	PEDB54
651	14 Aug. 1955	2121, 2209	PYLB55
450	13 Jan. 1957	2130	ROCR57a
300	25 Aug. 1957	2131	STEE57
HDFG:	340 14-17 Jan. 1958	2133	(1)
HDFG:	467 7-16 Jan. 1959	2138	(1)
	450 14 Feb. 1960	2139	ROCR60
	500+ 28 Sep. 1963	2307	ORDW63e
USFWS:	332 30 Aug. 1964	2212	(12)
Banko:	445 15 July 1966	2259	(18)
	380 23 July 1967	2231	GARJ67b
HDAS:	536 24 July 1968	2158, 2233, 2318-9	(1)
HDFG:	331 24 July 1968	2162	(1)

Table 12 (con't)

<u>No. Censused</u>	<u>Date</u>	<u>Appendix Serial No.</u>	<u>Source</u>
USFWS: 600+	15 July 1970	2273	(22)
620	10 Aug. 1970	2275	ANON70d
344	17 Aug. 1970	2776	ANON70d
HDFG: 304	8 Aug. 1973	2187,2285	(1)
HDFG: 525	4-5 Aug. 1976	2197,2248,2294	(2)
599+	9 Aug. 1976	2325	PYLR77
550+	5 Sep. 1976	2326	PYLR77
USFWS: 412	24 Sep. 1976	3032	(13)
USFWS: 328	13 Oct. 1976	3040	(13)
USFWS: 368	14 Oct. 1976	3041	(13)
USFWS: 454	16 Oct. 1976	3043	(13)
USFWS : 332	17 Oct. 1976	3044	(13)
435	25 Oct. 1976	3047	Fe@a77

Table 13.

Average Counts of Ae'o at West Loch (Honouliuli)
and Pearl City (Waiawa) Units, PHNWR, 1976-1979*

<u>Month</u>	<u>Pearl City Unit</u>				<u>Honouliuli Unit</u>			
	1976-1977-1978-1979				1976-1977-1978-1979			
January	21	38	42	6		7	9	2
February	12	15	92	7		35	20	7
March		17	71	7		2	61	14
April		80	84			65	58	
May	27	126	74			39	32	
June	20	118	83			22	21	
July	32	160	30		21	21	13	
August	61	136	17	135	8	8	22	7
September	164		45	6	29	45	89	10
October	237	138	68	8	29	59	3	29
November	81	100	26	12	45	10	21	9
December	57	123	14	12	13	4	2	6
Yearly Ave.	71	88	54	24	24	26	29	11

*fractions of average counts rounded to nearest whole number

Table 13a

Combined Counts of Ae'o on Kuapa and Paiko Lagoon,
1959 to 1969

<u>No. Seen</u>	<u>Date</u>	<u>Appendix Record No.</u>
68	27 Dec. 1959	2351
80	up to Jan. 1962	2355
ca. 80	23 Dec. 1962	2357
52	29 Dec. 1963	2358
64	27 Dec. 1964	2359
4 counts ranged 21-44; breeding probable	few years prior 1966	2361
42	2 Jan. 1966	2362
47	26 Dec. 1966	2363
3	31 Dec. 1967	2364
0 Kuapa...	28 Dec. 1969	2368
"bid goodbye-pau"...		
30 Paiko	28 Dec. 1969	2368

Table 14.

Ae'o Counts in 15 Quadrangles, 76 habitats,
Island of O'ahu, 1933-1982

Quadrangle & Designator Terms	Serial No's.	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave. No. Counted 1st Half Period	Ave. No. Counted 2nd Half Period
KAENA							
Kapaluaa	2419-2423	1976-1980	0	5			
Mokuleia	2424-2433	1973-1980	24	10	2.40	4.80	0
HALEIWA							
Haleiwa	2435-2440	1976-1980	17	6	2.83	.67	5.00
Helemano	2441-1445	1978-1981	0	4			
Kaiaka Bay	2496	1976	0	1			
Kawailoa	2447	1979	0	1			
Ukoa	2448-2458	1975-1980	64	11	5.82	2.36	9.27
Waialua	2459 (1 specimen coll. 1888)						
Waialua S.P.	2460-2462	1979-1980	20	3	6.67	12.67	.67
WAIANAE							
Makaha	2463-2478	1968-1978	82	16	5.13	7.00	3.25
Waianae	2479-2485	1967-1977	21	7	3.00	4.75	1.29
Yamaguchi	2486-2489	1974-1977	3	4	.75	1.50	0
SCHOFIELD BARRACKS							
Lualualei	2490-2500	1974-1977	14	11	1.27	2.55	0
EWA							
Barbers P.	2501-2502	1964-1968	40	2	20.00	12.00	28.00
Campbell	2503-2512	1975-1980	1	10	.10	.20	0
Malakole	2513-2514	1958-1959	2	6	3.00	4.00	2.00
WAIMEA							
Waialeale	2515-2516	1976-1977	1	10	.10	.20	1
Arboretum	2517	1978	0	1			
Waimea F.P.	2518-2521	1978-1980	0	4			
Waimea S.	2522-2523	1977	0	2			
KAHUKU							
JGNWR	2524-2532	1978-1981	624*	8*	78*	85*	71*
Kii	2533-2821	1946-1982	6283	274	22.93	21	24.82

Table 14 (con't)

Quadrangle & Designator Terms	Serial No's.	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave. No.	Ave. No.
						Counted 1st Half Period	Counted 2nd Half Period
Punamano	2822-2872	1968-1980	273	50	5.46	6.68	4.24
Air Strip	2873-2885	1964-1979	61	11	5.55	7.27	3.82
Aquafarm	2886-2887	1979-1980	6	2	3.00	2	4
Kawelo	2888	1979	0	1			
Kualoa	2889-2902	1968-1980	26	14	1.86	1.57	2.14
Kuilima	2903-2914	1975-1981	89	12	7.42	7.16	7.66
Laie P.F.	2915-2916	1979-1980	0	2			
Puna'pa	2917-2924	1973-1980	4	8	.50	1	0
HAUULA							
Opaeula	2925-2926	1981	0	1			
Wahiawa	2927-2929	1979	0	2			
KAHANA							
Apua	2930	1971	2	1	2.00		
Huilua	2931-2941	1975-1981	0	10			
Kahana	2942-2944	1956-1972	4	3	1.33	2	2
Molii	2945-2946	1971-1972	8	2	4.00	6	2
Punaluu	2947		0	1			
WAIPAHAU							
Aiea	2948-2960	1952-1959	48	13	3.69	5.30	1.85
College T.F.	2961-2962	1975-1976	0	2			
Pearl C.P.	2963-2972	1970-1977	293	10	29.30	13	45.60
Pearl C.U.	2973-3325	1976-1980	25,258	351	71.96	102.20	41.28
Sumida	3326-2220	1964-1976	3	4	.75	1.5	0
Makalena	3331-3332	1975-1976	0	2			
Waimalu	3333	1966	3	1	3.00		
Waipio G.C.	3334	1970	1	1	1.00		
KANEOME							
Heeia	3335-3342	1972-1980	0	8			
Nahaluu	3343-3346	1970-1976	10	4	2.5	5	0

* data calculated on basis of average daily use

Table 14 (con't)

Qwadrangle & Designator Terms	Serial No's.	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave. No. Counted 1st Half Period	Ave. No. Counted 2nd Half Period
MOKAPU							
Kailipulu	3347-3428	1934-1979	1864	77	24.21	46.29	8.79
Kaelepulu F.C.	3425-3428	1977-1979	3	4	.75	0	1.67
Kailua	3429	1953	(N.A.)				
KMCAS	3430-3542	1938-1981	4032	88	45.82	47.77	43.86
Nuupia	3543-3579	1947-1980	781	17	45.94	22.44	72.38
Sewage L.	3580-3583	1978-1980	27	4	6.75	7.50	6
Kaluapuhi	3584-3592	1966-1979	87	6	14.50	17	12
K. B. Park	3593-3596	1967-1970	38	4	9.50	10	9
Halekou	3597	1968	3	1			
Kawainui	3598-3618	1962-1980	46	20	2.3	2.6	2
Ka-Ha-Ma	3619-3626	1976-1980	36	8	4.5	6.5	2.5
Lanikai	3627-2629	1973-1977	11	3	3.67	2.67	4.67
Olomana	3630	1979	0	1			
PUULOLOA							
F.K.-H.H.	3631-3672	1958-1980	411	37	11.11	11.27	10.95
Honouliuli	3673-3688	1965-1980	46	16	2.88	4.88	.88
H.-PHNWR	3689-3958	1974-1980	6422	259	24.80	29.71	19.88
H.-PHNWR	3802,3832	1981-1982	(N.A.)				
	3802,3839,						
	3899,3924,						
	3959-3965						
W. PHNWR	3966-3980	1977-1982	(N.A.)				
Makalapa	3991-1982	1954	12	1	12.00		
U.S.N. Range	3983-3985	1956-1958	65	3	21.67	30.67	12.67
HONOLULU							
Keehi	3986-4028	1938-1980	1560	41	38.05	33	43.10
Islets	4029-4032	1978	(N.A.)				
Moanalua	4034-4073	1933-1947	3072	32	96	79	113
Nuuanu	4074-4087	1974-1981	1	13	.07	.14	0
Salt Lake	4088-4137	1956-1981	1450	44	32.95	56.86	9.05

Table 14 (con't)

Quadrangle & Designator Terms	Serial No's.	Census Period	Total No. Counted	Total Counts	Ave.No. Counted	Ave. No.	Ave. No.
						Counted 1st Half Period	Counted 2nd Half Period
Sand Island	4138-4156	1940-1976	334	14	23.85	35	12.71
KOKO HEAD							
Bellows	4157-4177	1963-1981	103	21	4.90	8.6	1.7
Kuapa	4178-4215	1947-1976	968	32	30.25	31.5	29
Paiko	4216-4437	1956-1981	1456	201	7.24	11.55	2.86
Waimanalo	4438	1970	35	1	35		

Table 15.

Islandwide Counts of Ae'o by HDFG on Moloka'i, 1958-1981

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1958	0		
1959	0		
1960	7		
1961	13		
1962	7		
1963	0		
1964	9		
1965	no census		
1966	no census		
1967	0		
1968	no census		
1969	0	0	
1970	0	no census	
1971	no census	0	
1972	no census	no census	12 (12 April)
1973	no census	8	
1974	no census	no census	
1975	no census	11	
1976	13	24	
1977	8	no census	
1978	14	no census	
1979	2	32	
1980	18	20	
1981			
	10.8 19.0	Grand Averages
	11.0 25.3	Averages for years in which census data are available for both monthly periods (1976, 1979, 1980)

Table 16.

Ae'o Counted by HDFG and USFWS at Kaunakakai, Moloka'i
1973 to 1980

<u>Year</u>	<u>March-July</u>	<u>August-February</u>
1973		2
1974		5
1975		11
1976	15	10-19-6-25-18-0-9-31-31 (16.6)
1977	6-5-3-2-1-5-2-5 (3.6)	14-14-11-10-6-20 (12.5)
1978	27	12-4-27-35-30 (21.6)
1979	3-2 (2.5)	2-30-24-6-8-14-10-4 (12.3)
1980	4-6 (5)	18-8 (13)
Grand Average (6.14)		(14.36)

Table 17.

Islandwide Counts of Ae'o by HDFG on Maui, 1957-1981

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1957	190		
1958	159		
1959	211		
1960	232		
1961	155		
1962	282		
1963	170		
1964	164		
1965	162		
1966	253		
1967	188		
1968	226	611	
1969	171	440	
1970	207	469	
1971		426	
1972			419 (12 April)
1973		216+	319 (19 Sep.)
1974			
1975		523	
1976	335		
1977		137	
1978	159		
1979	154	333	
1980	238	234	
1981	<u>410</u>		
	214	377	Grand Average
	199	417	Average 1968-1970, 1979-1980

Table 18.

Counts of Ae'o by HDFG on Plantation Irrigation Reservoirs,
Maui, 1958-1980

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1958	25		
1959	42		
1960	53		
1961	6		
1962	2		
1963	71		
1964	27		
1965	0		
1966	28		
1967	8		
1968	17	52	
1969	2	0	
1970		6	
1971		166	
1972			8 (12 Apr.)
1973			65 (19 Sep.)
1974		35	
1975		25	
1976	52	16	
1977	0	2	
1978	74	9	
1979	0	19	
1980	<u>9</u>		
	24.47 . . .	33.0 . . .	Grand Averages
	24.17 . . .	16.33 . .	Averages 1968-1969, 1976-1979

Table 19.

Ae'o Counted by HDFG and Cooperators at Kanaha,
Maui, 1951-1981

<u>Year</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1958	58		
1959	35		
1960	179		
1961	134		
1962	276		
1963	99		
1964	115	101	155
1965	150-150-155-117 (ave.143)	144-217-156 (ave.172)	211-171-155 (ave.179)
1966	200	415-200 (ave.326)	475-256 (ave.366)
1967	170		77-172 (ave.125)
1968	201	174-188-558 (ave.307)	
1969	107	206	223
1970	207	296-231-304-195 208-240-109-146 102-251 (ave.208)	498-463-498-441 413-172-375-383 442-426-295-255 275-309-216-209 (ave.373)
1971		255	150

Table 19 (con't)

<u>Year</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1972		255-71 (ave.163)	84,228,168,293 (ave. 193)
1973	297	242	231
1974			272
1975		77	77-61 (ave.69)
1976	137	117-176-207-206 237 (ave.189)	105-61-31-340-43 102 (ave.114)
1977	65-64-301 (ave.143)	65-135-141-191 103-47-55-47 (ave.98)	49-47-42-21-75-69 57-113-78-163 (ave.71)
1978	122-57-129-165 124 (ave.119)	105-174-169-135 196-173-142-142 (ave.155)	180-154-108-130 159-129 (ave.143)
1979	125-78 (ave.102)	127-152-141-165 206 (ave. 158)	198-184-246-201 131 (ave.192)
1980	122-88 (ave.105)	43-202-215-176 189 (ave.165)	143-146-156-121 107 (ave. 135)
1981	64		
Grand Averages . . . (145) . . . (192) . . . (187)			
Averages for years (157) . . . (181) . . . (196)			
in which census data are available in each monthly period (1964-1966, 1970, 1973, 1976-1980).			

Table 20.

Average Number of Ae'o Counted at Kanaha, Maui
1964 to 1981, by Monthly and Yearly Periods

<u>Years</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1964-1972	163	224	221
1973-1981	138	155	153
Grand Average all monthly periods: 1964-1972 (202)			
1973-1981 (148)			

Table 21.

Ae'o Counted by HDFG and Cooperators at Kealia,
Maui, 1958-1981

<u>Year</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1958	76		
1959	134		
1960	0 (?dry)		
1961	15		
1962	4		
1963			
1964	22	35 (May)	30 (Dec.)
1965	7	149 (July)	58-22-57 (Nov.), 30 (Dec.); (ave.42)
1966	25	29 (April)	0 (Aug.) (dry) - 0 (Oct.)
1967	10		135 (Oct.) - 57 (Nov.) (ave.96)
1968	8	113 (June) - 1 (July, nearly dry) (ave. 57)	
1969	62	180 (July)	82-82 (Nov.) (ave.82)
1970	0-36-36 (ave.24)	120 (April) -48-57-49 123 (June) -102-147 326-262 217 (July) - 69-0 (dry) (Aug.) (ave.127)	31-158-2 (Nov.) (ave.64)

Table 21 (cont'd)

<u>Year</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1971		5 (July)	
1972		156 (April)	105 (Aug.)
1973			95 (Sept.)
1974			245 (Aug.)
1975	80+	421 (July)	421 (Aug.) - 75 (Nov.) (ave.248)
1976	146-66-66 (ave.93)	51-41-22-35-22-9+ - 87(Mar) - 50 (Apr.) - 8-31-33 (May) - 18 27 (June) - 100-139 (July) (ave.45)	182-199-206-184 (Aug.) 272-291 (Sep.) - 75+ (Oct) - 316 (Nov.) 177 (Dec.) (ave.211)
1977	269-355 16 (ave.213)	276-276 (Mar.) - 18 32 (Apr.) -116 (May) 65-112 (June) - 213- 175-88 (July) (ave.137)	149-172 (Aug.) - 296 295 (Sep.) - 326-427 (Oct.) - 247-201-301- 230 (Nov.) - 177-42 (Dec.) (ave.239)
1978	46-28-69 37 (ave.45)	11-9 (Mar.) - 20 (Apr.) 35 (July) (ave.19)	38 (Oct.) - 76 (Dec.) (ave.57)
1979	26	24 (Mar.) -41 (Apr.) 50 (May) - 26 (June) 131 (July) (ave.54)	116 (Aug.) - 82 (Dec.) (ave.99)

Table 21 (cont'd)

<u>Year</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1980	107-60 (ave.84)	24 (Mar.) -36 (Apr.) 47 (May) - 14 (June) 33 (July) (Ave.31)	43 (Aug.) - 204 (Sep.) 87 (Oct.) - 173 (Nov.) 167 (Dec.) (ave.135)
1981	298		

Grand Averages . . . (65) . . . (103) . . . (116)

Average for years . . (62) . . . (112) . . . (110)
in which census data area available in each monthly period (1964-1966,
1969, 1970, 1975-1980)

Table 22

Average Number of Ae'o Counted at Kealia,
Maui, 1964 to 1981, by Monthly and Yearly Periods

<u>Years</u>	<u>January-February</u>	<u>March-July</u>	<u>August-December</u>
1964-1972	23	92	60
1973-1981	120	118	166
Grand Average for all monthly periods: 1964-1972 (58)			
1973-1981 (135)			

Table 22a

Islandwide Count of Ae'o by HDFG
on the Island of Hawai'i, 1958 to 1981

<u>Year</u>	<u>January</u>	<u>July/August</u>	<u>Other</u>
1958	0		
1961	1		
1962	0		
1963	11		
1964	21		
1965	27		
1966	28		
1967	19		
1968	38	19	
1969	35	24	
1970	24	27	
1971	27	19	
1972	27	16	
1973	24	17	
1974	20	22	
1975	16	17	
1976	22	15	
1977	18	26	
1978	11	22	
1979	22	18	
1980	25	20	
1981	20		
	<hr/>	<hr/>	
Average	20	20	

Table 23.

Ae'o Counted in 16 Quadrangles, 25 Habitats,
Island of Hawaii, 1942-1981

<u>Quadrangle & Habitat</u>	<u>Serial No.'s</u>	<u>Census Period</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Ave. No. Counted 1stHalf Period</u>	<u>Ave.No. Counted 1stHalf Period</u>
HAWI							
Kehena	5079-5088	1975-1980	0	10			
P. Okmmu	5089-5097	1975-1980	0	9			
U. Mill	5098-5106	1975-1980	0	9			
Upolu BB	5107-5115	1975-1980	0	9			
KAWAIHAE							
Kahua RR	5116-5117	1980	0	2			
KUKUINAELE							
Kukuhale	5118-5127	1975-1980	0	10			
Lalakea	5128-5136	1975-1980	0	9			
Waipio	5138-5146	1975-1981	0	9			
ANAEHOOMALU							
Nahapapa	5147-5148	1972	4	2	2	2	2
PUU HINAI							
F. Brown	5149-5157	1975-1980	0	9			
MAKALAWENA							
Opauala	5158-5243	1962-1980	1,166	81	14.4	15.5	13.2
KEAHOLE POINT							
Aimakapa	5246-5314	1942-1980	466	63	7.4	7.9	6.9
Kaloko	5315-5344	1961-1981	25	29	.9	1.5	.1
KAILUA							
Naupulehu	5345	1965	1	1	1	N.A.	N.A.
HUALALAI							
Huehue	5346-5353	1975-1980	0	8			
HONAUNAU							
Napoopoo	5354	?1960	2	1		N.A.	N.A.
KA LAE							
Naalwalu	5355-5364	1975-1980	0	10			
NAALEHU							
Honuapo	5365-5372	1975-1981	0	8			

Table 23 (con't)

<u>Quadrangle & Habitat</u>	<u>Serial No.'s</u>	<u>Census Period</u>	<u>Total No. Counted</u>	<u>Total Counts</u>	<u>Ave.No. Counted</u>	<u>Ave. No. Counted 1stHalf Period</u>	<u>Ave.No. Counted 1stHalf Period</u>
PUNALUU							
Pumaluu	5373-5381	1968-1980	2	9	.22	.44	0
KEAAU RANCH							
Keaau	5382-5389	1975-1980	0	8			
HILO							
Ahn	5390-5399	1975-1980	0	10			
Nakagawa	5400-5418	1975-1980	0	9			
Wailoa	5409-5418	1975-1980	0	10			
HONOKAA							
H. Mill	5419-5420	1976-1977	0	2			
Kukaiau	5421-5429	1975-1980	0	9			

* includes average daily use figures as single count

Addendum: (1) Matsunami, resident of Waipio Valley from 1954 to 1966, stated that a few Ae'o came and stayed briefly in the estuary every winter when the sea was rough; however they have apparently never been censused there. (2) Cooper reported seeing 6-8 Ae'o at Kiholo Fishposds (KIHODO quadrangle) a few times previously to 29 January 1970; however, this species has likewise never been counted there (5137, 5245). (5137, 5245).

Table 24

Distribution by Decade of 5,413 Records of Ae'o in
the Hawaiian Islands, from 1870 to 1981

1770's -	1850's -	1920's - 0
1780's -	1860's -	1930's - 33
1790's -	1870's - 3	1940's - 69
1800's -	1880's - 6	1950's - 173
1810's -	1890's - 23	1960's - 665
1820's -	1900's - 5	1970's - 3,969
1830's -	1910's - 1	1980's - 466
1840's -		

Table 25.

Number of Ae'o Censused Statewide in January and
July/August by HDFG and Cooperators from 1956 to 1981

Kaua'i

<u>Years</u>		<u>January</u>	<u>Years</u>	<u>July/August</u>
1956-1967	(12)	Range: 0-55 Ave. 14	1956-1967	(no data)
1968-1976	(5)	Range: 9-117 Ave. 48	1968-1973	(5) Range: 54-122 Ave. 92
1977-1981	(5)	Range: 21-318 Ave. 146	1974-1981	(6) Range: 116-381 Ave. 283

Ni' ihau

1968-1974		(no data)	1968-1973	(6) Range: 0-155 Ave. 81
1975-1981	(6)	Range: 44-203 Ave. 135	1974-1980	(6) Range: 14-51 Ave. 40

O'ahu

1956-1961	(5)	Range: 134-549 Ave. 330	1956-1961	(6) (no data)
1962-1967	(6)	Range: 175-485 Ave. 275	1962-1967	(6) (no data)
1968-1974	(7)	Range: 107-509 Ave. 283	1975-1981	(5) Range: 369-785 Ave. 536
1975-1981	(7)	Range: 110-439 Ave. 315	1975-1981	(5) Range: 231-588 Ave. 486

Table 25 (Cont'd)

<u>Years</u>		<u>January</u>	<u>Moloka'i</u> <u>Years</u>		<u>July/August</u>
1960-1964	(4)	Range: 7-13 Ave. 9	1958-1972	(15)	(no data)
1976-1981	(6)	Range: 2-18 Ave. 12	1973-1980	(5)	Range: 8-32 Ave. 19
<u>Maui</u>					
1957-1961	(5)	Range: 155-232 Ave. 189	1957-1961	(5)	(no data)
1962-1966	(5)	Range: 162-282 Ave. 206	1962-1967	(6)	(no data)
1967-1970	(4)	Range: 171-226 Ave. 198	1968-1971	(4)	Range: 426-611 Ave. 487
1971-1975	(5)	(no data)	1972-1974	(3)	(no data)
1976-1981	(5)	Range: 154-410 Ave. 259	1975-1980	(4)	Range: 137-523 Ave. 238
<u>Hawai'i</u>					
1958-1967	(8)	Range: 0-28 Ave. 13	1958-1967	(8)	(no data)
1968-1974	(7)	Range: 20-38 Ave. 28	1968-1974	(7)	Range: 16-27 Ave. 21
1975-1981	(7)	Range: 11-25 Ave. 19	1975-1980	(6)	Range: 15-26 Ave. 20

Table 26.

Average Number of Ae'o Counted Statewide
in Last 5 to 7 Year Periods

<u>Island</u>	<u>January</u>	<u>Percent Total</u>	<u>July/August</u>	<u>Percent Total</u>
Kaua'i	146	16.48	283	26.06
Ni'ihau	135	15.23	40	3.68
O'ahu	315	35.55	486	44.75
Moloka'i	12	1.35	19	1.75
Maui	259	29.23	238	21.91
Hawai'i	19	2.14	20	1.84
Totals	886	99.98%	1,086	99.99%

APPENDIX

1. Observation, reports, and specimen records are organized by island group, island, district, and/or quadrangle map. Order of listing, names and locations of district and quadrangle boundaries are explained and illustrated in CPSU/UH Avian History report 4: Introduction to Part I, Population Histories--Species Accounts.
- 2 . Acronyms composed of the first three letters of the author's (or senior author's) last name, the initial letter of the first name, and last two digits of the year of publication represent sources found in the bibliography under references cited. For example, BRYW01 = Bryan, W. A., and Alvin Seale. 1901. Notes on the birds of Kauai. Bishop Museum Occ. Papers. 1(3): 129-137. In cases where it is necessary to distinguish between two or more articles published by an author in any given year, letters are added to the acronym in alphabetical sequence, e.g., BRYW01a = Bryan, W. A. 1901. A dey to the birds of the Hawaiian group. Bishop Museum Press. 76 pp.

 Parenthetical numbers such as (5), represent references listed under unpublished Sources cited in the bibliography.
3. Place-names are cited in original form.
4. Parenthetical information is qwalified.

Himantopus mexicanus knudseni

Relative Abundance/Locality	Date	Source
Southeastern Hawaiian Islands		
1 common in ponds and swamps / all over the group	(1879)	DOLS79
2 common...generally abundant in places where the receding tide leaves extensive flats of black mud exposed (where they form small flocks to varying number but sometimes consisting of 20 to 30 individuals...also found commonly about the brackish or freshwater ponds / on Niihau, Kauai, Oahu, Molokai, and Maui	(1892-1896)	PERR03
3 (unspecified numbers) / apparently distributed over all the islands...Palmer sent me skins from Oahu, Kauai, Niihau, and Molokai	(1900)	ROTW00
4 becoming scarcer and scarcer / in all districts	(1903)	HENH02
5 slaughtered...usually shot and thrown away...quite exterminated / in amy localities	(1903)	HENH02
6 occasionally seen / along the sea coast or about the saltwater marshes	(1915)	BRYW15a
7 was common / on Kauai, Niihau, Oahu, and Molokai	(1944)	MUNG44
8 present also / on Maui	(1944)	MUNG44
9 seems no record / on Hawaii; probably migrated between the islands as the remnants now existing appear to do between Oahu and Niihau	(1944)	MUNG44
10 now reduced to about 200 birds and will surely vanish entirely if not given adequate protection. It is still on the list of game birds.../ (Kauai, Niihau, Oahu, Molokai, Maui)	(1944)	MUNG44

11	We believe, that in spite of its dwindling habitat, the closed hunting season on the Islands during the recent war and its continuation for stilts permitted the population to increase to approximately 1,000 Southeastern Hawaiian Islands--(Continuted)	1946-1947	SCHC51	
12	HDFG: 338 censused, annual waterfowl count / (islandwide)	4-10 Jan. 1956	(1)	
13	HDFG: 468 censused, annual waterfowl count / (islandwide)	1-31 Jan. 1957	(1)	
14	HDFG: 556 censused, annual waterfowl count / Kauai, Oahu, Molokai, Maui, Hawaii	14-18 Jan. 1963	(1)	
15	HDFG: 734 censused, annaul waterfowl count / Kauai, Oahu, Molokai, Maui, Hawaii	15 Jan. 1964	(1)	
16	HDFG: 391 censused, annual waterfowl count / Kauai, Oahu, Maui, Hawaii	14 Jan. 1965	(1)	8
17	HDFG: 530 censused, annaul waterfowl count / Kauai, Oahu, Molokai, Maui, Hawaii	13-14 Jan. 1966	(1)	
18	HDFG: 436 censused, annual waterfowl count / Kauai, Oahu, Molokai, Maui, Hawaii	13-16 Jan. 1967	(1)	
19	HDFG: 448 censused, annual waterfowl count / Kauai, Oahu, Molokai, Maui	8-10 Jan. 1968	(1)	
20	HDFG: 1,287 censused...not annual stilt count / State-wide (Niihau and Molokai not included)	24 July 1968	(1)	
21	HDFG: 417 censused, annual waterfowl count / Kauai, Oahu, Molokai, Maui, and Hawaii	13-14 Jan. 1969	(1)	
22	HDFG: 1,513 censused, annual stilt count / (all islands: Hawaii, Kauai, Niihau, Oahu, Molokai, Maui)	24 July 1969	(1)	

- | | | | |
|----|--|-------------------------------|--------|
| 23 | HDFG: 1,187 censused, annual stilt count /
(all islands: Kauai, Niihau, Oahu, Molokai,
Maui, Hawaii) | 7 Aug. 1970 | (1) |
| 24 | HDFG: 934 censused, annual stilt count /
(all islands: Kauai, Niihau, Oahu, Molokai,
Maui, Hawaii) | 27 July 1971 | (1) |
| 25 | 1,215 censused / State-wide count | (1974) | MARD75 |
| 26 | outlook for this stilt is much improved...
refuge acquisition is now in progress on the
major Hawaiian Islands | (1975) | MARD75 |
| 27 | HDFG: Objectives...of Statewide summer and
winter surveys is to determine abundance and
distribution of population, and to record en-
vironmental factors affecting numbers and
distribution...and...to measure effects of
habitat improvement projects at Kanaha Pond,
Maui, and Paiko Lagoon, Oahu...Procedures...
indicate...one-day comprehensive air and/or
ground coverage of all significant habitats by
HDFG, USFWS and other qualified cooperators...
following prescribed routes by qualified observers
using binoculars and telescopes...and notation
of environmental conditions affecting efficiency
and results obtained... | 1 July 1975 -
30 June 1976 | (2) |
| 28 | HDFG: 1,478 censused in August 1976 and 1,161
counted in January 1977 indicates that many
birds may utilize odd habitats, probably flooded
fields and pastures, at that season and escape
detection... | 1 July 1976 -
30 June 1977 | (2) |
| 29 | Shallenberger: currently classified as "en-
dangered" by both State and Federal laws...
data suggest regular annual movement between
Kauai and Niihau. Some movment between
other islands has been confirmed, but extent
of movement is unknown...Annual HDFG/USFWS
counts over the last 20 years show unexplained | (1977) | (3) |

fluctuations, sometimes exceeding 200%...Maui and Oahu, on the average, account for approximately 80% of stilt in Hawaii. Primary nesting and feeding areas on these islands include Kanaha Pond, Kealia Pond, Pearl Harbor and Kaneohe Marine Air Corps Station. Numbers on Molokai and Hawaii have been relatively stable (less than 300 each). Population on Kauai appears to be increasing, yet this may also reflect increased count coverage in recent years. The total population for the Islands is estimated at 1,500 birds / still present on all islands for which there are historical records (Niihau, Kauai, Oahu, Molokai, Maui, Hawaii)

- | | | | |
|----|--|-------------------------------|----------------|
| 30 | HDFG: 1,090 censused / (Statewide) | summer, 1977 | (5) |
| 31 | HDFG: 1,151 censused / (Statewide) | winter, 1977 | (5) |
| 32 | total population estimated at 1500 / (Statewide) | 1977 | SHAR78a ∞
∞ |
| 33 | 1,476 censused in Aug. 1976...1,161 recorded in Jan. 1977...recovery team believes these totals differ in part to seasonal changes, consequently there is very little real difference in population...present (1977) population in estimated at 1,500...primary objective of Recovery Plan is to provide and maintain population of 2,000 | (1977) | (46) |
| 34 | HDFG: 2 marked (color banded) at Hanalei NWR (Kauai) and 21 marked at Pearl Harbor NWR (Oahu) . . .sightings so far seem to indicate that the majority remain on the same island and within a few miles of their banding site ...of the 18 individuals seen after marking, 15 (83%) remained within 3.2 miles of their banding/release site...two others, both banded at the Waiawa Unit, Pearl Harbor NWR, were seen at the Kii Unit, James Campbell NWR (Oahu)...most surprising movement was a male | 1 July 1977 -
30 June 1978 | (4) |

banded 20 December 1977 at Hanalei NWR (Kauai), recovered in a mist net on the Waiawa Unit, Pearl Harbor NWR, on 22 March 1978...one other stilt movement has been previously documented, that marked in October 1968 at Kanaha (Maui) seen 3 months later at Kahuku (Oahu) on two different occasions...based on observed synchronized population fluctuations stilt are also assumed to migrate between the islands of Niihau and Kauai... / (Statewide study)

- | | | | |
|----|---|--------------------------------|---------|
| 35 | HDFG: decrease of 394 in summer count of 1,090 may reflect low breeding success due to dry spring and summer in 1977 | 1 July 1977 -
30 June 1978 | (2) |
| 36 | HDFG: comprehensive semi-annual censuses are relatively indicative of total populations | 1 July 1977 -
30 June 1978 | (2) |
| 37 | approximately 80 percent of Statewide population usually accounted for (on two islands) / Maui and Oahu | (1978) | SHAR78a |
| 38 | still present / (Niihau, Kauai, Oahu, Molokai, Maui, Hawaii) | (1978) | SHAR78a |
| 39 | regular movement (Statewide) between Kauai and Niihau, and less often between other islands, has been recorded but the extent of this movement is unknown | (1978) | SHAR78a |
| 40 | Population counts (Statewide) over the last 20 years show unexpected fluctuations, some exceeding 200%. | (1978) | SHAR78a |
| 41 | HDFG: 975 censused / (Statewide) | summer, 1978 | (5) |
| 42 | HDFG: 890 censused / (Statewide) | winter, 1978 | (5) |
| 43 | HDFG: 34 males and 30 females color-banded and released...bringing total marked since December 1977 to 117...one color banded male found dead of unknown causes...of 117 banded since inception | July 1978 through
Aug. 1979 | (6) |

of project, 92 (80%) have been seen at least once since marking...12 (14%) observed in the 1977-78 banding year but not seen during current period ...amount of intra-island movement still not clear...appears to be a moderate amount of movement, both adult and juvenile, between nesting areas on Oahu, though most remain in the vicinity of the nesting grounds (Pearl Harbor and James Campbell National Wildlife Regues, Nuupia Ponds on the Kaneohe Marine Corps Air Station)...one juvenile however was recorded nearly 22 miles destant three days after banding...amount of interisland movement is also unclear...only two examples of movement of over 110 marked on Oahu have been recorded seen there again 16 April, then at Kaunakakai sewage pond on Molokai 14 September 1979; the other stilt, a male banded on PHNWR on 14 March 1979, seen on numerous occasions in the Pearl Harbor area until 8 May when seen at Kanaha Pond on 6 October 1979...only one of two marked birds in over 350 individually inspected for bands at Kanaha and Kealia ponds in early October...It is still possible, however, that larger interisland movement may be observed during periods of acute weather patterns... / (Statewide study)

- | | | | |
|----|---|-------------------------|-----|
| 44 | HDFG: 1,276 censused / (Statewide) | summer, 1979 | (5) |
| 45 | HDFG: 523 censused / (Statewide) | winter, 1979 | (5) |
| 46 | HDFG: 1,012 censused...summer populations (Statewide) in 1980 were down (21%) from the 1979 count...summer counts have remained close to 1,000 since the summer count of 1977 (after which wintering population of migratory waterfowl fell dramatically for unexplained reasons). The apparent decreases on Kauai and Maui during the 1980 survey accounted for the drop in numbers although slightly more were found on Oahu...Census data for this species, unlike those for koloea and gallinule, are judged relatively compre- | 31 July,
1 Aug. 1980 | (5) |

hensive and complete...(age data) indicate that 13 percent of stilts counted and classified by age were sub-adult. Although this gives a good estimate of productivity for the 1980 breeding season, chicks which hatched late in the season probably were not counted... Chicks less than 30 days old or which have not gained full powers of flight are usually much more secretive than older juveniles / (Statewide)

47	HDFG: 881 censused / (Statewide)	winter, 1980	(5)
48	HDFG: 1,185 censused / (Statewide)	12-14 Jan. 1981	(5)
48a	1,100 estimated	(1982)	ANON82

Island of Kaua'i

ISLANDSWIDE INFERENCE

49	HDFG: only 3 censused, annual waterfowl count / (islandwide)	Jan. 1956	(1)
50	HDFG: 6 censused, annual waterfowl count / (islandwide)	1-31 Jan. 1957	(1)
51	HDFG: none recorded, annual waterfowl count / (islandwide)	14-17 Jan. 1958	(1)
52	HDFG: 12 censused, annual waterfowl count / (islandwide)	7-16 Jan. 1959	(1)
53	HDFG: 14 censused, annual waterfowl count / (islandwide)	4-8 Jan. 1960	(1)
54	resident in small numbers / on a few scattered, lowland marshy areas	(June-Aug. 1960)	RICF64
55	HDFG: 8 censused, annual waterfowl count / (islandwide)	10-13 Jan. 1961	(1)

56	HDFG: none recorded, annual waterfowl count / (islandwide)	15-17 Jan. 1962	(1)
57	HDFG: 19 censused, annual waterfowl count / (islandwide)	14-18 Jan. 1963	(1)
58	HDFG: 55 censused, annual waterfowl count / (islandwide)	15 Jan. 1964	(1)
59	HDFG: 18 censused, annual waterfowl count / (islandwide)	14 Jan. 1965	(1)
60	HDFG: 7 censused, annual waterfowl count / (islandwide)	13-14 Jan. 1969	(1)
61	HDFG: 20 censused, annual waterfowl count / (islandwide)	13-16 Jan. 1967	(1)
62	HDFG: 9 censused, annual waterfowl count / (islandwide)	8-10 Jan. 1968	(1)
63	HDFG: 92 censused, annual stilt count / (islandwide)	24 July 1968	(1)
64	HDFG: 49 censused, annual waterfowl count / (islandwide)	13-14 Jan. 1969	(1)
65	HDFG: 109 censused, annual stilt count / (islandwide)	24 July 1969	(1)
66	HDFG: officially classed as rare / island of Kauai	(1969)	(7)
67	HDFG: 12 censused, annual waterfowl count / (islandwide)	13-15 Jan. 1970	(1)
68	HDFG: 54 censused / (islandwide)	7 Aug. 1970	(1)
69	HDFG: 51 censused / (islandwide)	13 Jan. 1971	(8)

- | | | | |
|----|--|-------------------------------|-----|
| 70 | HDFG: several areas previously used have been destroyed recently by filling, draining, and commercial development / (islandwide) | 1 July 1970 -
30 June 1971 | (8) |
| 71 | HDFG: 78 censused, annual stilt count / (islandwide) | 27 July 1971 | (1) |
| 72 | HDFG: 120 censused / (islandwide) | 30 July 1971 | (8) |
| 73 | HDFG: 47 censused / (islandwide) | 12 April 1972 | (1) |
| 74 | HDFG: counts this year ranged between 21 and 145...peaked in November and bottomed in February...fluctuations can be attributed to seasonal migration...actual reasons for migration are lack of suitable nesting habitat on Kauai, flooding on Kauai which reduces size of feeding areas and shallow shoreline habitat, improved habitat on Niihau as winter rains reflood dry lake beds, competition with migratory waterfowl in the winter may encourage movement to areas not utilized so heavily... regular observations of three nests revealed no successful broods...floods damaged two nests and a third nest suffered an unknown disturbance which eliminated three clutches of eggs...observations indicate stilts may re-nest if previous nests fail...20 were captured, banded, dyed and released...marked stilts may move up to 20 miles away from release site before dye faded... / (selected lowland habitats islandwide) | 1 July 1971 -
30 June 1972 | (8) |
| 75 | HDFG: movements of 20 dyed on 27, 28, 29 September at Kekaha pasture noted for 3 months, after which most apparently left the island...majority moved to Kekaha Sugar Co. mud settling pond after release...in subsequent weeks further dispersion to Kekaha Slaughterhouse reservoir, Hanapepe Salt Pond, Waita Reservoir, one reported at Hanalei... / (islandwide) | 1 July 1971 -
30 June 1972 | (8) |

- 76 HDFG: presumptive age class analysis of 21 stilts netted at Kekaha Pasture in September indicated that a relatively high rate of population turnover occurs...10 out of 21 were judged immature...if population turnover is actually as great as indicated, then nesting success is an important survival factor / (islandwide) 1 July 1971 - 30 June 1972 (8)
- 77 HDFG:...quarterly census totals ranged between 74 and 108...low (count) occurred in the winter and high during the fall...range this year not nearly so great as usual...ponds on Niihau were dry...presumably the majority remained on Kauai where there is more permanent open water...in analyzing population dynamics it is difficult to separate movement from productivity...distribution on Kauai is dependent mostly upon water levels in various habitat areas...11 of 19 are temporary and provide for no all-year use, 14 of 19 are man-made and subject to side fluctuations in water level and human disturbance...freshly flooded areas are most attractive because they provide a temporary new supply of invertebrates that are washed in for food...several stilts observed trapping schools of mosquito fish in Mana Base Pond...one caught 5 within a minute...most fresh water habitats support abundant supplies of these introduced fish...temporary habitats such as sugar plantation settling basins provide artificial feeding areas...stilt often feed around water delivery pipes which carry insects, larvae and worms washed off the sugar cane into the settling basin...dependence of stilts on these man-made habitats is great as the greatest limiting factor of populations on Kauai is the shortage of natural open shallow water areas with depths less than 6 inches...no nests observed this year despite intensive search...however successful clutches at Mana Base Pond resulted in 7 chicks discovered in June / (islandwide) 1 July 1972 - 30 June 1973 (8)

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|----|--|-------------------------------|-----|
| 78 | HDFG: Quarterly populations were all above average except for fall census...extremely dry weather on Niihau during the winter and spring months probably caused stilts to remain on Kauai...habitat conditions of Kauai were stable and changed very little during the period... / (islandwide) | 1 July 1972 -
30 June 1973 | (8) |
| 79 | HDFG: 122 censused / (islandwide) | 8 Aug. 1973 | (1) |
| 80 | HDFG: populations ranged between 0 and 120 during the quarterly censuses this year... high during the summer and low during the winter...atypical because stilt usually peak during the fall...four year record of monthly rainfall and quarterly stilt population (data) collected on Kauai between July 1970 and June 1974 shows a noticeable correlation between the Kauai stilt population and monthly rainfall...stilt populations on Kauai invairable decreawse soon after heavy winter rains commence... / (islandwide) | 1 July 1973 -
30 June 1974 | (8) |
| 81 | HDFG: 158 counted 2 August on 8 of 45 areas covered on census routes this year (only on the 20 areas covered in precious years) / (islandwide) | 1 July 1974 -
30 June 1975 | (8) |
| 82 | HDFG: 84 counted 8 November on 8 of 45 areas covered on census rountes this year (only 38 on the 20 areas covered in previous years) / (islandwide) | 1 July 1974 -
30 June 1975 | (8) |
| 83 | HDFG: 53 counted 22/23 January on 8 of 45 areas covered on census routes this year (some 33 on the 20 areas covered in previous years) / (islandwide) | 1 July 1974 -
30 June 1975 | (8) |

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|----|--|-------------------------------|-----|
| 84 | HDFG: 16 counted on 8 April on 2 or 45 areas covered on census routes this year (only 2 on the 20 areas covered in previous years) / (islandwide) | 1 July 1974 -
30 June 1975 | (8) |
| 85 | HDFG: quarterly count revealed high of 135 on summer and low of 16 on spring counts / (islandwide) | 1 July 1974 -
30 June 1975 | (8) |
| 86 | HDFG: according to quarterly counts, abundance and distribution followed trend similar to usual ones of previous years...highest during summer, tapering off during the fall, winter and spring...lowest population occurring during the spring, apparently because water levels on Niihau were sufficient to keep them there through April...population on Kauai increased in June, probably because of a subsequent drop in water levels on Niihau...if Kauai and Niihau stilt populations are essentially one, then the summer Kauai-Niihau total population would have been 209 and the winter population 188...a thorough on-the-ground census of the Hanalei taro fields revealed that previous counts with a spotting telescope at the "overlook" were inaccurate. As in past years, Hanalei, Kekaha Pastures, Kekaha Settling Basin and Lihue Plantation Settling Basin were the most heavily used habitats on Kauai... Nesting habitat is lacking on Kauai, as only the Mana Base Pond, Mana Brackish Pond and Hanalei NWR are known to regularly support nesting stilts / (islandwide) | 1 July 1974 -
30 June 1975 | (8) |
| 87 | HDFG: 381 censused / (islandwide) | 1 Aug. 1975 | (2) |
| 88 | HDFG: 117 censused / (islandwide) | 15 Jan. 1976 | (2) |
| 89 | HDFG: Comprehensive...censuses...conducted... in August and January...record numbers...were counted during the summer survey...partly as a result of the increase in the number of habitats surveyed, but also apparently, because of | 1 July 1975 -
30 June 1976 | (2) |

an exceptional year of productivity...the normal migration of stilt from Kauai to Niihau was delayed this year, possibly because of the late advent of winter kona storms, which are believed to be the stimulus that initiates their movement / (islandwide)

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|----|--|-------------------------------|-----|
| 90 | HDFG: Drought conditions during the summer and fall caused...abnormal distribution...stilts especially were found in habitats where they are not normally seen...stilts were counted in greater numbers (381) than ever before during the summer census...high count partly due to the fact that more habitats were covered (in the censuses) and partly to apparently good productivity - of 51 examined for age, 11 were judged immature and 40 adult ...Winter census revealed noticeable drop in population, probably as a result of movement of some to Kauai (?Oahu) though a greater number than usual remained on Kauai this winter. In most years, a majority of the stilt moved to Niihau during the fall months with the first heavy Kona storms. Kauai did not receive its first true Kona storm until after the winter census this year. By this observation it is probable that these storms are the stimulus which initiate movement of stilt from Kauai to Niihau / (islandwide) | 1 July 1975 -
30 June 1976 | (2) |
| 91 | HDFG: 372 censused / (islandwide) | Aug. 1976 | (2) |
| 92 | HDFG: 318 censused / (islandwide) | Jan. 1977 | (2) |
| 93 | HDFG: lack of heavy kona storms this winter resulted in there being negligible migration of stilts from Kauai to Niihau / (islandwide) | 1 July 1976 -
30 June 1977 | (2) |
| 94 | HDFG: A severe winter drought on Kauai and Niihau resulted in the concentration of stilts in record numbers on Kauai / (islandwide) | 1 July 1976 -
30 June 1977 | (2) |

95	Shallenberger: (apparent populations have) increased considerable in recent years, presumably due to the combined influence of habitat improvement, increased breeding success and more through habitat coverage on surveys... In most years, the majority...appear to leave the island during the fall months and return in the spring with young birds. The pattern may vary under abnormally dry weather conditions, causing stilts to remain on Kauai through the winter / (islandwide)	(1977)	(3)
96	HDFG: 326 censused / (islandwide)	27-28 July 1977	(2)
97	HDFG: 173 censused / (islandwide)	12-13 Jan. 1978	(2)
98	HDFG: sharp decrease in numbers censused is attributed to severe drought in 1977, and the consequent lack of sufficient productivity to offset annual mortality...many that normally migrate to Niihau remained on Kauai for the second winter in a row... / (islandwide)	1 July 1977 - 30 June 1978	(2)
99	HDFG: 21 censused / (islandwide)	15,16,20 Jan. 1979	(5)
100	HDFG: a particularly poor nesting season... no nests found at Lihue Plantation, Grove Farm, and Kekaha Sugar Co. settling basins... open mudflat habitat noticeably lacking on Kauai / (islandwide)	1979	(9)
101	HDFG: 346 censused / (islandwide)	1, 2 Aug. 1979	(5)
102	HDFG: 103 censused / (islandwide)	14-16 Jan. 1980	(5)
103	HDFG: of 93 classified by age, only 4 percent were judged to be immature birds / (islandwide)	(31 July 1980)	(5)
104	HDFG: 116 censused / (islandwide)	31 July, 1 Aug. 1980	(5)

105	HDFG: 117 censused / (islandwide)	12-14 Jan. 1981	(5)
UNDESIGNATED LOCATION			
106	Knudsen collected 2 specimens / unspecified locality	(1887?)	(10)
107	Palmer collected 5 specimens / unspeeified locality	Feb.-Mar. 1891; July-Dec. 1893	(10)
108	Munro collected 2 specimens / unspecified locality	May 1895; Oct. 1899	(10)
109	Seale collected 3 specimens / unspecified locality	4 May 1900	(10)
110	Collett collected 1 specimen / unspecified locality	(1892?)	(10)
MULTI-QUADRANGLE / LOCALITY			
111	HDFG: 17 censused, annual waterfowl count / West Kauai	14-18 Jan. 1963	(1)
112	HDFG: 2 censused, annual waterfowl count / East Kauai	14-18 Jan. 1963	(1)
113	HDFG: 3 censused, annual stilt count / Mana to Polihale	7 Aug. 1970	(1)
114	44 censused...0730 to 1700 hours...Christmas count / main belt road from Wailua to Kokee... Mana and Wailua rice and taro beds between Houselots and Homesteads Road	29 Dec. 1970	SEAW71
115	HDFG: 21 censused, annual stilt count / Mana to Polihale	27 July 1971	(1)
116	2 censused / rivers, streams, and holding ponds...within a 15 mile diameter circle, center foothill junction of Makaleha and	27 Dec. 1971	SEAW72

Anahola Mts. to include north of Wailua
middlefork to Hanalei Bay

117	31 censused / streams, holding ponds, and irrigation ditches...within a 15 mile diameter circle, center north of Belt Road between Puhi and Koloa exits, to include south of Wailua middlefork to Kalaheo and Hanapepe Valley	27 Dec. 1971	SEAW72
118	4 censused / streams, holding ponds, and irrigation ditches...within a 15 mile diameter circle, center a bit east of junction of Kokee Road from Waimea and Kekaha	27 Dec. 1971	SEAW72
119	64 censused, Christmas Count / Lihue area	Dec. 1972	SEAW79
120	0 (?) censused, Christmas Count / Lihue area	Dec. 1973	SEAW79
121	censused 20 / Kapaa area, center foothill junction of Makaleha and Anahola Mountains	14 Dec. 1974	SEAW75
122	censused 9 / Lihue area, center N of belt road between Puhi and Koloa exits to include south of Wailua middle fork to Kalaheo and Hanapepe valley	15 Dec. 1974	SEAW75
123	censused 14 / Waimea area, center E of junction of Kokee Road from Waimea and Kekaha	28 Dec. 1974	SEAW75
124	censused 2, Christmas Count / Lihue area	Dec. 1975	SEAW79
125	censused 33, Christmas Count / Lihue area	Dec. 1976	SEAW79
126	censused 2, Christmas Count / Huleia Stream, Waita Reservoir, Kahili Mtn. Park	17 Dec. 1977	SEAW78a
127	censused 3, Christmas Count / Nawiliwili Harbor, Memehune Fishpond to Knudsen Gap Road, oceanside of Koloa Sugar Mill	17 Dec. 1977	SEAW78a
128	censused 8, Christmas Count / Oceanside of Belt Road from Wailua River to Kalapak	17 Dec. 1977	SEAW78a

Bay, Paradise Pacifica, Holding ponds west of Lihue to Wailua Falls, Ponds west of Waita Reservoir

129	censused 110, Christmas Count / Kapaa (area)	18 (?) Dec. 1977	KAWD78
130	113, including 3 juveniles, counted / taro fields, Hanalei and Waiole Valleys	31 Mar. 1978	PYLR78d
131	HDFG: 9 nests located in 1977, 7 in 1978... 65% hatching success estimated in 1977, 62% (by end of report period) in 1978...chick survival considered very low in 1977, less than 50% in 1978	1 July 1977 to 30 June 1978	(43)
132	censused 24, Christmas Count / Count center was foothill junction of Makaleha and Anahola mountains (as in 1977)	24 Dec. 1978	KAWD79
133	censused 60, Christmas Count / area of undescribed parameters near Kapaa	22 Dec. 1979	ANON80a
134	censused 19, Christmas Count / south of Lihue to Knudsen Gap Road, including Waita Reservoir, Kipu Ranch	(Dec. 1980)	SEAW81
135	censused 10, Christmas Count / Wailua River to north side of Lihue, including airport road and holding ponds west to Lihue	(Dec. 1980)	SEAW81
136	censused 1, Christmas Count / Omao Road, Koloa town and Poipu	(Dec. 1980)	SEAW81

QUADRANGLE/LOCALITY

MAKAHA POINT

Kolo Reservoir

137	HDFG: 0 summer survey	1974	(8)
138	HDFG: 0 fall survey	1974	(8)

139	HDFG:	0	winter survey	1974-75	(8)
140	HDFG:	0	spring survey	1975	(8)
141	HDFG:	0	1 Aug.	1975	(2)
142	HDFG:	0	15 Jan.	1976	(2)
143	HDFG:	0	4-5 Aug.	1976	(2)
144	HDFG:	0	13 Jan.	1977	(2)
145	HDFG:	0	27-28 Jul.	1977	(2)
146	HDFG:	0	12-13 Jan.	1978	(2)
147	HDFG:	0	27-28, 30 Jul.	1978	(5)
148	HDFG:	0	15-16, 20 Jan.	1979	(5)
149	HDFG:	0	1-2 Aug.	1979	(5)
150	HDFG:	0	14-16 Jan.	1980	(5)
151	HDFG:	0	12 Jan.	1981	(5)

Saki Mana Reservoir

152	HDFG:	0	summer survey	1974	(8)
153	HDFG:	0	fall survey	1974	(8)
154	HDFG:	0	winter survey	1974-75	(8)
155	HDFG:	0	spring survey	1975	(8)
156	HDFG:	0	1 Aug.	1975	(2)
157	HDFG:	0	15 Jan.	1976	(2)
158	HDFG:	0	4-5 Aug.	1976	(2)

159	HDFG:	0	13 Jan.	1977	(2)
160	HDFG:	0	27-28 Jul.	1977	(2)
161	HDFG:	0	12-13 Jan.	1978	(2)
162	HDFG:	0	15-16, 20 Jan.	1979	(2)
163	HDFG:	0	1-2 Aug.	1979	(2)
164	HDFG:	0	14-16 Jan.	1980	(2)
165	HDFG:	0	31 Jul., 1 Aug.	1980	(2)

HAENA

Haena Pond

166	HDFG:	0	(dry) 24 Jul.	1968	(1)
167	Shallenberger:	0	observed during two visits (20 May, 21 July 1977)...unaware of any records...marsh is badly encroached by grasses...only a small (10'x 20') oval of open water (was present)	(1977)	(3)

Wainiha Taro/River Fields

168	HDFG:	0	24 Jul.	1968	(1)
169	HDFG:	0	summer survey	1974	(8)
170	HDFG:	0	fall survey	1974	(8)
171	HDFG:	0	winter survey	1974-75	(8)
172	HDFG:	0	spring survey	1975	(8)
173	HDFG:	0	1 Aug.	1975	(2)
174	HDFG:	0	15 Jan.	1976	(2)

175	HDFG:	0	4-5 Aug.	1976	(2)
176	HDFG:	0	13 Jan.	1977	(2)
177	HDFG:	0	27-28 Jul.	1977	(2)
178	HDFG:	0	12-13 Jan.	1978	(2)
179	HDFG:	0	27-28, 30 Jul.	1978	(5)
180	HDFG:	0	15-16, 20 Jan.	1979	(5)
181	HDFG:	0	1-2 Aug.	1979	(5)
182	HDFG:	0	14-16 Jan.	1980	(5)

Wainiha Valley

183	Shallenberger: widely distributed in taro fields throughout the Valley...a maximum of 14 was counted on the two survey days (20 May, 22 Jul) including one flock of 7 in a recently planted field...comparatively few (historical) data...no more than 2...noted on earlier counts...Presumably there is some movement of birds between this Valley and more extensive habitat in Hanalei Valley, so numbers of stilt probably vary considerably with condition of taro fields. No evidence of nesting but the survey was too brief and too late in the nesting season to be certain that nesting does not occur.			(1977)	(3)
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HANALEI

Hanalei Valley

184	sm. flock	9 May 1957	CURA58
185	6 seen	25,26 Apr. 1959	CAMM59
186	7 seen	13 July (1960)	RICF64

187	2 doz. seen	16-23 Nov. 1966	ORDW67
188	HDFG: 26	13-14 Jan. 1969	(1)
189	4 captured	Jan. 1969	SINJ69
190	HDFG: 6	13-15 Jan. 1970	(1)
191	2 seen	18 Aug. 1971	HANR75
192	17 censused	16 Dec. 1973	HARA74
193	Shallenberger: widely distributed...almost totally restricted to the artificial habitat created by taro fields. In years of normal rainfall patterns, most stilt leave in January and February and head for breeding sites elsewhere on Kauai and probably Niihau ...in abnormally dry years nearly all remain throughout the winter and spring, presumably because wetland habitat on Niihau is dry... nesting by small numbers has been observed in Hanalei Valley	(1977)	(3)

Hanalei River Estuary

194	HDFG: 2	24 July 1968	(1)
195	HDFG: 0	summer survey	(8)
196	HDFG: 0	fall survey 1974	(8)
197	HDFG: 0	winter survey	(8)
198	HDFG: 0	spring survey 1975	(8)

Hanalei National Wildlife Refuge

199	HDFG: 0	summer survey 1974	(8)
200	HDFG: 34	8 Nov. 1974	(8)

201	HDFG: 15	22-23 Jan. 1975	(8)
202	HDFG: 14	8 Apr. 1975	(8)
203	181 (peak)	3 Sept. 1976	ZEIF77
204	Shallenberger:...have shown a dramatic increase in population under management... a small number nest each year...review of more detailed and repetitive surveys by USFWS biologist the past three years (for which see referenced report) is considerably more relevant than survey data secured 19,31 May and 18,21 July 1977.	(1977)	(3)
205	easily observed	19 Mar. 1977	WATJ77
206	USFWS: 57, ave. daily use	Oct.-Dec. 1979	(13)
207	USFWS: 52, ave. daily use	Jan.-Mar. 1980	(13)
208	USFWS: 28, ave. daily use	Apr.-Jun. 1980	(13)
209	USFWS: 21, ave. daily use	Jul.-Sep. 1980	(13)
210	USFWS: 54, ave. daily use	Oct.-Dec. 1980	(13)
211	USFWS: 38, ave. daily use	Jan.-Mar. 1981	(13)
212	USFWS: 28, ave. daily use	Apr.-Jun. 1981	(13)
213	USFWS: 40, ave. daily use	Jul.-Sep. 1981	(13)
214	USFWS: not censused	15 Nov.-15 Dec. 1981	(13)
215	USFWS: 2, ave. daily use	16 Dec. 1981 to 15 Jan. 1982	(13)
216	USFWS: 0, ave. daily use	16 Feb.-31 Mar. 1982	(13)
217	USFWS: 10, ave. daily use	Apr. 1982	(13)

218	USFWS: 11, ave. daily use	May 1982	(13)
219	USFWS: 12, ave. daily use	June 1982	(13)

Hanalei National Wildlife Refuge Lookout Survey

220	12	4 Sept. 1961	BOWJ62
221	present	5 Nov. (1967)	DONW68 <u>b</u>
222	HDFG: 56	1 Aug. 1975	(2)
223	HDFG: 43	15 Jan. 1976	(2)
224	HDFG: 114	4,5 Aug. 1976	(2)
225	HDFG: 52	13 Jan. 1977	(2)
226	HDFG: 0	12,13 Jan. 1978	(2)
227	HDFG: 78	27,28,30 July 1978	(5)
228	HDFG: 11	15,16,20 Jan. 1979	(5)
229	HDFG: 109	1,2 Aug. 1979	(5)
230	HDFG: 59	14-16 Jan. 1980	(5)

Hanalei National Wildlife Refuge Auto/Foot Survey

231	HDFG: 39	1 Aug. 1975	(2)
232	HDFG: 11	15 Jan. 1976	(2)
233	HDFG: 26	4,5 Aug. 1976	(2)
234	HDFG: 27	13 Jan. 1977	(2)
235	HDFG: 21	27,28 July 1977	(2)
236	HDFG: 85	12,13 Jan. 1978	(2)

237	HDFG:	12	27,28,30 July 1978	(5)
238	HDFG:	0	15,16,20 Jan. 1979	(5)
239	HDFG:	2	1,2 Aug. 1979	(5)
240	HDFG:	8	14-16 Jan. 1980	(5)

Hanalei Taro Fields (154 Acres in 1964)

241	HDFG:	up to 50 have been counted in 21 surveys	1964-1966	(11)
242	HDFG:	36	24 July 1968	(1)
243	HDFG:	4	24 July 1969	(1)
244	HDFG:	19	7 Aug. 1970	(1)
245	HDFG:	6	14 Sept. 1970	(12)
246	HDFG:	4	30 Nov. 1970	(8)
247	HDFG:	18	12 Jan. 1971	(8)
248	HDFG:	0	22 Apr. 1971	(8)
249	HDFG:	6	27 July 1971	(1)
250	HDFG:	19	7 Aug. 1971	(8)
251	HDFG:	48	9 Nov. 1971	(8)
252	HDFG:	3	29 Feb. 1972	(8)

Hanalei Taro Fields (Continued)

253	HDFG:	0	12 Apr. 1972	(8)
254	HDFG:	14	3 Aug. 1972	(8)

255	HDFG:	10	11 Nov. 1972	(8)
256	HDFG:	18	18 Jan. 1973	(8)
257	HDFG:	20	17 Apr. 1973	(8)
258	HDFG:	28	9 Aug. 1973	(8)
259	HDFG:	10	15 Nov. 1973	(8)
260	HDFG:	0	15 Jan. 1974	(8)
261	HDFG:	0	10 Apr. 1974	(8)
262	HDFG:	26	2 Aug. 1974	(8)
263	HDFG:	17	8 Nov. 1974	(8)
264	HDFG:	7	22,23 Jan. 1975	(8)
265	HDFG:	0	spring survey 1975	(8)

Hanalei Post Office Taro Fields

266	HDFG:	10	1 Aug. 1975	(2)
267	HDFG:	0	15 Jan. 1976	(2)
268	HDFG:	10	4,5 Aug. 1976	(2)
269	HDFG:	15	13 Jan. 1977	(2)
270	HDFG:	16	27,28 July 1977	(2)
271	HDFG:	24	12,13 Jan. 1978	(2)
272	HDFG:	15	27,28,30 July 1978	(5)
273	HDFG:	0	15,16,20 Jan. 1979	(5)
274	HDFG:	14	1,2 Aug. 1979	(5)

275	HDFG: 5	14-16 Jan. 1980	(5)
276	HDFG: 1 chick seen	(31 July 1980)	(5)

Hanalei Trader Taro Fields

277	HDFG: 2	1 Aug. 1975	(2)
278	HDFG: 0	15 Jan. 1976	(2)
279	HDFG: 12	4,5 Aug. 1976	(2)
280	HDFG: 8	13 Jan. 1977	(2)
281	HDFG: 11	27,28, July 1977	(2)
282	HDFG: 2	27,28,30 July 1978	(5)
283	HDFG: 0	15,16,20 Jan. 1979	(5)
284	HDFG: 0	1,2 Aug. 1979	(5)
285	HDFG: 0	14-16 Jan. 1980	(5)

Kalihiwai River Estuary

286	HDFG: 0	summer survey 1974	(8)
287	HDFG: 0	fall survey 1974	(8)
288	HDFG: 0	winter survey 1974-75	(8)
289	HDFG: 0	spring survey 1975	(8)
290	HDFG: 0	1 Aug. 1975	(2)
291	HDFG: 0	15 Jan. 1976	(2)
292	HDFG: 0	4-5 Aug. 1976	(2)
293	HDFG: 0	13 Jan. 1977	(2)

294	HDFG:	0	27-28 Jul. 1977	(2)
295	HDFG:	0	12-13 Jan. 1978	(2)
296	HDFG:	0	27-28,30 Jul. 1978	(5)
297	HDFG:	0	15-16,20 Jan. 1979	(5)
298	HDFG:	0	1-2 Aug. 1979	(5)
299	HDFG:	0	14-16 Jan. 1980	(5)
300	HDFG:	0	31 Jul.,1 Aug 1980	(5)
301	HDFG:	0	12 Jan. 1981	(5)

Lower Hanalei River

302	HDFG:	0	1 Aug. 1975	(2)
303	HDFG:	0	15 Jan. 1976	(2)
304	HDFG:	0	4-5 Aug. 1976	(2)
305	HDFG:	0	13 Jan. 1977	(2)
306	HDFG:	0	27-28 Jul. 1977	(2)
307	HDFG:	0	12-13 Jan. 1978	(2)
308	HDFG:	0	27-28,30 Jul. 1978	(5)
309	HDFG:	0	15-16,20 Jan. 1979	(5)
310	HDFG:	0	1-2 Aug. 1979	(5)
311	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
312	HDFG:	0	12 Jan. 1981	(5)

Kalihiwai Reservoir

313	HDFG:	0	1 Aug. 1975	(2)
314	HDFG:	0	15 Jan. 1976	(2)
315	HDFG:	0	4-5 Aug. 1976	(2)
316	HDFG:	0	13 Jan. 1977	(2)
317	HDFG:	0	27-28 Jul. 1977	(2)
318	HDFG:	0	12-13 Jan. 1978	(2)
319	HDFG:	0	27-28,30 Jul. 1978	(5)
320	HDFG:	0	15-16,20 Jan. 1979	(5)
321	HDFG:	0	1-2 Aug. 1979	(5)
322	HDFG:	0	14-16 Jan. 1980	(5)

Kalihiwai Prawn Farm

323	HDFG:	0	12-13 Jan. 1978	(2)
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Lumahai River

324	HDFG:	0	24 Jul. 1968	(1)
325	HDFG:	49	24 Jul. 1969	(1)
326	HDFG:	0	summer survey 1974	(8)
327	HDFG:	0	fall survey 1974	(8)
328	HDFG:	0	winter survey 1974-75	(8)
329	HDFG:	0	spring survey 1975	(8)
330	HDFG:	0	1 Aug. 1975	(2)

331	HDFG:	0	15 Jan. 1976	(2)
332	HDFG:	0	4-5 Aug. 1976	(2)
333	HDFG:	0	13 Jan. 1977	(2)
334	HDFG:	6	27-28 Jul. 1977	(2)
335	HDFG:	0	12-13 Jan. 1978	(2)
336	HDFG:	0	27-28,30 Jul. 1978	(5)
337	HDFG:	0	15-16,20 Jan. 1979	(5)
338	HDFG:	0	1-2 Aug. 1979	(5)
339	HDFG:	0	14-16 Jan. 1980	(5)

Lumanai Valley

340	Shallenberger: 2 were counted on 20 May when they were on mudflats during a particularly low tide...The species appears on only one of the 46 USFWS counts in recent years, however an attempt to schedule these trips around periods of low tide probably would have resulted in greater numbers... species observed on both highway and on water surveys (20 May, 21 July)		(1977)	(3)
341	HDFG:	0	summer survey 1974	(8)
342	HDFG:	0	fall survey 1974	(8)
343	HDFG:	0	winter survey 1974-75	(8)
344	HDFG:	0	spring survey 1975	(8)

Princeville Golf Course Ponds

345	HDFG:	0	1 Aug. 1975	(2)
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346	HDFG:	0	15 Jan. 1976	(2)
347	HDFG:	0	4-5 Aug. 1976	(2)
348	HDFG:	0	13 Jan. 1977	(2)
349	HDFG:	0	27-28 Jul. 1977	(2)
350	HDFG:	0	12-13 Jan. 1978	(2)
351	HDFG:	0	27-28,30 Jul. 1978	(5)
352	HDFG:	0	15-16,20 Jan. 1979	(5)
353	HDFG:	0	1-2 Aug. 1979	(5)
354	HDFG:	0	14-16 Jan. 1980	(5)

Waioli Taro Fields

355	HDFG:	18	1 Aug. 1975	(2)
356	HDFG:	27	15 Jan. 1976	(2)
357	HDFG:	33	4-5 Aug. 1976	(2)
358	HDFG:	9	13 Jan. 1977	(2)
359	HDFG:	54	27-28 Jul. 1977	(2)
360	HDFG:	28	12-13 Jan. 1978	(2)
361	HDFG:	34	27-28,30 Jul. 1978	(5)
362	HDFG:	2	15-16,20 Jan. 1979	(5)
363	HDFG:	7	1-2 Aug. 1979	(5)
364	HDFG:	5	14-16 Jan. 1980	(5)

Waipa Taro Fields

365	HDFG:	0	summer survey 1974	(8)
366	HDFG:	7	8 Nov. 1974	(8)
367	HDFG:	1	22-23 Jan. 1975	(8)
368	HDFG:	0	spring survey 1975	(8)
369	HDFG:	33	1 Aug. 1975	(2)
370	HDFG:	13	15 Jan. 1976	(2)
371	HDFG:	14	4-5 Aug. 1976	(2)
372	HDFG:	9	13 Jan. 1977	(2)
373	HDFG:	6	27-28 Jul. 1977	(2)
374	HDFG:	5	12-13 Jan. 1978	(2)
375	HDFG:	6	27-28,30 Jul. 1978	(5)
376	HDFG:	2	15-16,20 Jan. 1979	(5)
377	HDFG:	11	1-2 Aug. 1979	(5)
378	HDFG:	0	14-16 Jan. 1980	(5)

Wilcox Ponds

379	HDFG:	0	summer suvey 1974	(8)
380	HDFG:	0	fall survey 1974	(8)
381	HDFG:	0	winter survey 1974-75	(8)
382	HDFG:	0	spring survey 1975	(8)
383	HDFG:	0	1 Aug. 1975	(2)

384	HDFG:	0	15 Jan. 1976	(2)
385	HDFG:	0	4-5 Aug. 1976	(2)
386	HDFG:	0	13 Jan. 1977	(2)
387	HDFG:	0	27-28 Jul. 1977	(2)
388	HDFG:	4	12-13 Jan. 1978	(2)
389	HDFG:	0	27-28,30 Jul. 1978	(5)
390	HDFG:	0	15-16,20 Jan. 1979	(5)
391	HDFG:	0	1-2 Aug. 1979	(5)
392	HDFG:	0	14-16 Jan. 1980	(5)

ANAHOLA

Anahola Estuary

393	HDFG:	0	1 Aug. 1975	(2)
394	HDFG:	0	15 Jan. 1976	(2)
395	HDFG:	0	4-5 Aug. 1976	(2)
396	HDFG:	0	13 Jan. 1977	(2)
397	HDFG:	0	27-28 Jul. 1977	(2)
398	HDFG:	0	12-13 Jan. 1978	(2)
399	HDFG:	0	15-16,20 Jan. 1979	(5)
400	HDFG:	0	14-16 Jan. 1980	(5)
401	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
402	HDFG:	0	12 Jan. 1981	(5)

Anahola Valley

403	Shallenberger: 0 seen on 21 May and 23 July surveys but it is likely that they visit temporarily flooded pastures and small taro fields in the upper portions of the valley	(1977)	(3)
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Kaloko Reservoir

404	HDFG: 0	summer suvey 1974	(8)
405	HDFG: 0	fall survey 1974	(8)
406	HDFG: 0	winter survey 1974-75	(8)
407	HDFG: 0	spring survey 1975	(8)
408	HDFG: 0	1 Aug. 1975	(2)
409	HDFG: 0	15 Jan. 1976	(2)
410	HDFG: 0	4-5 Aug. 1976	(2)
411	HDFG: 0	13 Jan. 1977	(2)
412	HDFG: 0	27-28 Jul. 1977	(2)
413	HDFG: 0	12-13 Jan. 1978	(2)
414	HDFG: 0	27-28,30 Jul. 1978	(5)
415	HDFG: 0	15-16,20 Jan. 1979	(5)
416	HDFG: 0	1-2 Aug. 1979	(5)
417	HDFG: 0	14-16 Jan. 1980	(5)

Kaloko Prawn Farm

418	HDFG: 0	12-13 Jan. 1978	(2)
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Kamoku Pastures

419	HDFG:	0	1 Aug. 1975	(2)
420	HDFG:	0	15 Jan. 1976	(2)
421	HDFG:	0	4-5 Aug. 1976	(2)
422	HDFG:	0	13 Jan. 1977	(2)
423	HDFG:	0	27-28 Jul. 1977	(2)
424	HDFG:	0	12-13 Jan. 1978	(2)
425	HDFG:	0	27-28,30 Jul. 1978	(5)
426	HDFG:	0	15-16,20 Jan. 1979	(5)
427	HDFG:	0	1-2 Aug. 1979	(5)
428	HDFG:	0	14-16 Jan. 1980	(5)

Kaneha Reservoir

429	HDFG:	0	1 Aug. 1975	(2)
430	HDFG:	0	15 Jan. 1976	(2)
431	HDFG:	0	4-5 Aug. 1976	(2)
432	HDFG:	0	13 Jan. 1977	(2)
433	HDFG:	0	27-28 Jul. 1977	(2)
434	HDFG:	0	12-13 Jan. 1978	(2)
435	HDFG:	0	15-16,20 Jan. 1979	(5)
436	HDFG:	0	1-2 Aug. 1979	(5)
437	HDFG:	0	14-16 Jan. 1980	(5)

438 HDFG: 0

31 Jul., 1 Aug. 1980 (5)

Kanehu Reservoir #1

439 HDFG: 0

1 Aug. 1975 (2)

440 HDFG: 0

15 Jan. 1976 (2)

441 HDFG: 0

4-5 Aug. 1976 (2)

442 HDFG: 0

27-28 Jul. 1977 (2)

443 HDFG: 0

12-13 Jan. 1978 (2)

444 HDFG: 0

15-16,20 Jan. 1979 (5)

445 HDFG: 0

1-2 Aug. 1979 (5)

446 HDFG: 0

14-16 Jan. 1980 (5)

Kanehu Reservoir #2

447 HDFG: 0

1 Aug. 1975 (2)

448 HDFG: 0

15 Jan. 1976 (2)

449 HDFG: 0

4-5 Aug. 1976 (2)

450 HDFG: 0

13 Jan. 1977 (2)

451 HDFG: 0

27-28 Jul. 1977 (2)

452 HDFG: 0

12-13 Jan. 1978 (2)

453 HDFG: 0

15-16,20 Jan. 1979 (5)

454 HDFG: 0

1-2 Aug. 1979 (5)

455 HDFG: 0

14-16 Jan. 1980 (5)

456 HDFG: 0

12 Jan. 1981 (5)

Kanehu Reservoir #3

457	HDFG:	0	1 Aug. 1975	(2)
458	HDFG:	0	15 Jan. 1976	(2)
459	HDFG:	0	4-5 Aug. 1976	(2)
460	HDFG:	0	13 Jan. 1977	(2)
461	HDFG:	0	27-28 Jul. 1977	(2)
462	HDFG:	4	12-13 Jan. 1978	(2)
463	HDFG:	0	15-16, 20 Jan. 1979	(5)
464	HDFG:	0	1-2 Aug. 1979	(5)
465	HDFG:	0	14-16 Jan. 1980	(5)
466	HDFG:	0	12 Jan. 1981	(5)

Kilauea Estuary

467	HDFG:	0	summer suvey 1974	(8)
468	HDFG:	0	fall survey 1974	(8)
469	HDFG:	0	winter survey 1974-75	(8)
470	HDFG:	0	spring survey 1975	(8)
471	HDFG:	0	1 Aug. 1975	(2)
472	HDFG:	0	15 Jan. 1976	(2)
473	HDFG:	0	4-5 Aug. 1976	(2)
474	HDFG:	0	13 Jan. 1977	(2)
475	HDFG:	0	27-28 Jul. 1977	(2)

476	HDFG:	0	12-13 Jan. 1978	(2)
477	HDFG:	0	15-16,20 Jan. 1979	(5)
478	HDFG:	0	1-2 Aug. 1979	(5)
479	HDFG:	0	14-16 Jan. 1980	(5)
480	HDFG:	0	12 Jan. 1981	(5)

Mimino Reservoir

481	HDFG:	0	1 Aug. 1975	(2)
482	HDFG:	0	15 Jan. 1976	(2)

Morita Reservoir

483	HDFG:	0	24 Jul. 1968	(1)
484	HDFG:	0	24 Jul. 1969	(1)
485	HDFG:	0	1 Aug. 1975	(2)
486	HDFG:	0	15 Jan. 1976	(2)
487	HDFG:	0	4-5 Aug. 1976	(2)
488	HDFG:	0	13 Jan. 1977	(2)
489	HDFG:	0	27-28 Jul. 1977	(2)
490	HDFG:	4	12-13 Jan. 1978	(2)
491	HDFG:	0	27-28,30 Jul. 1978	(5)
492	HDFG:	0	15-16,20 Jan. 1979	(5)
493	HDFG:	0	1-2 Aug. 1979	(5)
494	HDFG:	0	14-16 Jan. 1980	(5)

Pu Ka Ele Reservoir

495	HDFG:	0	1 Aug. 1975	(2)
496	HDFG:	0	15 Jan. 1976	(2)
497	HDFG:	0	4-5 Aug. 1976	(2)
498	HDFG:	0	13 Jan. 1977	(2)
499	HDFG:	0	27-28 Jul. 1977	(2)
500	HDFG:	4	12-13 Jan. 1978	(2)
501	HDFG:	0	27-28,30 Jul. 1978	(5)
502	HDFG:	0	15-16,20 Jan. 1979	(5)
503	HDFG:	0	1-2 Aug. 1979	(5)
504	HDFG:	0	14-16 Jan. 1980	(5)

Waiakalua Reservoir

505	HDFG:	0	summer suvey 1974	(8)
506	HDFG:	0	fall survey 1974	(8)
507	HDFG:	0	winter survey 1974-75	(8)
508	HDFG:	0	spring survey 1975	(8)
509	HDFG:	0	1 Aug. 1975	(2)
510	HDFG:	0	15 Jan. 1976	(2)
511	HDFG:	0	4-5 Aug. 1976	(2)
512	HDFG:	0	13 Jan. 1977	(2)
513	HDFG:	0	27-28 Jul. 1977	(2)

514	HDFG:	4	12-13 Jan. 1978	(2)
515	HDFG:	0	27-28,30 Jul. 1978	(5)
516	HDFG:	0	15-16,20 Jan. 1979	(5)
517	HDFG:	0	1-2 Aug. 1979	(5)

KEKAHA

Kekaha

518	reported abundant in lagoons	(1893)	WILS96
519	10 seen in grassy pond ca. 5 miles west	4 Mar. 1961	KINB61
520	0 seen	(May 1963	ANON63b
521	9 seen	(2 Jun.) 1963	ANON63c

Kekaha Pasture

522	HDFG:	53	30 Nov. 1970	(8)
523	HDFG:	3	12 Jan. 1971	(8)
524	HDFG:	2	22 Apr. 1971	(8)
525	HDFG:	21	27 Jul. 1971	(8)
526	HDFG:	0	7 Aug. 1971	(8)
527	HDFG:	16	9 Nov. 1971	(8)
528	HDFG:	3	29 Nov. 1971	(8)
529	HDFG:	13	12 Apr. 1972	(8)
530	HDFG:	2	3 Aug. 1972	(8)
531	HDFG:	28	11 Nov. 1972	(8)

532	HDFG: 8	18 Jan. 1973	(8)
533	HDFG: 8	17 Apr. 1973	(8)
534	HDFG: 14	9 Aug. 1973	(8)
535	HDFG: 4 caught, banded, dyed and released ...followup observations of marked stilts in western Kauai habitats for about a month, then none were seen thereafter since they migrated away from Kauai...only one observ- ation of a banded stilt was made since return of the stilt population in the spring of 1974.	17,18 Sep. 1973	(8)
536	HDFG: 0	15 Nov. 1973	(8)
537	HDFG: 0	15 Jan. 1974	(8)
538	HDFG: 0	10 Apr. 1974	(8)
539	HDFG: 39	2 Aug. 1974	(8)
540	HDFG: 0	fall survey 1974	(8)
541	HDFG: 5	22-23 Jan. 1975	(8)
542	HDFG: 0	spring survey 1975	(8)
543	HDFG: 57	1 Aug. 1975	(2)
544	HDFG: 0	15 Jan. 1976	(2)
545	HDFG: 1	4-5 Aug. 1976	(2)
546	HDFG: 33	19 Oct. 1976	(14)
547	HDFG: 3	13 Jan. 1977	(2)
548	HDFG: 15	29 Jun. 1977	(14)
549	HDFG: 45	27-28 Jul. 1977	(2)

550	HDFG:	4	12-13 Jan. 1978	(2)
551	HDFG:	20	27-28,30 Jul. 1978	(5)
552	HDFG:	0	15-16,20 Jan. 1979	(5)
553	HDFG:	19	1-2 Aug. 1979	(5)
554	HDFG:	0	14-16 Jan. 1980	(5)
Kekaha Settling Basin				
555	HDFG:	18	24 Jul. 1969	(1)
556	HDFG:	19	14 Sep. 1970	(12)
557	HDFG:	2	12 Apr. 1972	(1)
558	HDFG:	21	9 Aug. 1973	(8)
559	HDFG:	0	15 Nov. 1973	(8)
560	HDFG:	0	15 Jan. 1974	(8)
561	HDFG:	0	10 Apr. 1974	(8)
562	HDFG:	15	2 Aug. 1974	(8)
563	HDFG:	1	8 Nov. 1974	(8)
564	HDFG:	0	winter survey 1974-75	(8)
565	HDFG:	0	spring survey 1975	(8)
566				
567	HDFG:	37	1 Aug. 1975	(2)
568	HDFG:	52	4-5 Aug. 1976	(2)
569	HDFG:	28	19 Oct. 1976	(14)

570	HDFG:	98	13 Jan. 1977	(2)
571	HDFG:	39	15 Apr. 1977	(14)
572	HDFG:	27	26 May 1977	(14)
573	HDFG:	15	29 Jun. 1977	(14)
574	HDFG:	20	27-28 Jul. 1977	(2)
575	HDFG:	0	12-13 Jan. 1978	(2)
576	HDFG:	26	27-28,30 Jul. 1978	(5)
577	HDFG:	0	15-16,20 Jan. 1979	(5)
578	HDFG:	49	1-2 Aug. 1979	(5)
579	HDFG:	0	14-16 Jan. 1980	(5)

Kekaha Slaughterhouse Reservoir

580	HDFG:	20	24 Jul. 1969	(1)
581	USFWS:	3	14 Sep. 1970	(12)
582	HDFG:	0	15 Jan. 1971	(2)
583	HDFG:	6	3 Aug. 1972	(8)
584	HDFG:	0	11 Nov. 1972	(8)
585	HDFG:	0	18 Jan. 1973	(8)
586	HDFG:	2	17 Apr. 1973	(8)
587	HDFG:	5	9 Aug. 1973	(8)
588	HDFG:	1	15 Nov. 1973	(8)
589	HDFG:	0	15 Jan. 1974	(8)

590	HDFG:	0	10 Apr. 1974	(8)
591	HDFG:	0	summer suvey 1974	(8)
592	HDFG:	0	fall survey 1974	(8)
593	HDFG:	0	winter survey 1974-75	(8)
594	HDFG:	0	spring survey 1975	(8)
595	HDFG:	5	1 Aug. 1975	(2)
596	HDFG:	7	4-5 Aug. 1976	(2)
597	HDFG:	2	13 Jan. 1977	(2)
598	HDFG:	2	27-28 Jul. 1977	(2)
599	HDFG:	0	12-13 Jan. 1978	(2)
600	HDFG:	1	27-28,30 Jul. 1978	(5)
601	HDFG:	0	15-16,20 Jan. 1979	(5)
602	HDFG:	16	1-2 Aug. 1979	(5)
603	HDFG:	0	14-16 Jan. 1980	(5)

Kahelunui Reservoir

604	HDFG:	0	summer suvey 1974	(8)
605	HDFG:	0	fall survey 1974	(8)
606	HDFG:	0	winter survey 1974-75	(8)
607	HDFG:	0	spring survey 1975	(8)
608	HDFG:	0	1 Aug. 1975	(2)
609	HDFG:	0	15 Jan. 1976	(2)

610	HDFG:	0	4-5 Aug. 1976	(2)
611	HDFG:	0	13 Jan. 1977	(2)
612	HDFG:	0	27-28 Jul. 1977	(2)
613	HDFG:	0	12-13 Jan. 1978	(2)
614	HDFG:	0	15-16, 20 Jan. 1979	(5)
615	HDFG:	0	1-2 Aug. 1979	(5)
616	HDFG:	0	14-16 Jan. 1980	(5)
617	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
618	HDFG:	0	12 Jan. 1981	(5)

Mana (Area) Ponds

619	HDFG:	2 nests found	4 May 1895	(15)
620	2 seen		8 Apr. (1963)	ANON63d
621	HDFG:	0	24 Jul. 1968	(1)
622	HDFG:	3	30 Nov. 1970	(8)
623	HDFG:	0	12 Jan. 1971	(8)
624	HDFG:	2	22 Apr. 1971	(8)
625	HDFG:	0	27 Jul. 1971	(8)
626	HDFG:	3	7 Aug. 1971	(8)
627	HDFG:	0	9 Nov. 1971	(8)

628	HDFG: 6	29 Feb. 1972	(8)
629	HDFG: 3	12 Apr. 1972	(8)
630	HDFG: 6	3 Aug. 1972	(8)
631	HDFG: 4	11 Nov. 1972	(8)
632	HDFG: 4	18 Jan. 1973	(8)
633	HDFG: 15	17 Apr. 1973	(8)
634	HDFG: 9	9 Aug. 1973	(8)
635	HDFG: 12	15 Nov. 1973	(8)
636	HDFG: 0	15 Jan. 1974	(8)
637	HDFG: 7	10 Apr. 1974	(8)
638	HDFG: 2 nests	spring 1975	(3)
639	Shallenberger: observed at both ponds	16 May 1977	(3)
640	Shallenberger: observed at both ponds... maximum of 5 seen	19-20 Jul. 1977	(3)
641	HDFG: 44-egg nests located...1st found 6 March, last on 16 June...3 nests success- ful 1 flooded	Oct 1980-Sept '81	(47)
Mana Base Pond			
642	HDFG: 9	8 Aug. 1973	(1)
643	HDFG: 1 nest found	10 Apr. 1974	(8)
644	HDFG: 4	2 Aug. 1974	(8)

645	HDFG:	3	8 Nov. 1974	(8)
646	HDFG:	0	22-23 Jan. 1975	(8)
647	HDFG:	nest found	8 Apr. 1975	(8)
648	HDFG:	2	8 Apr. 1975	(8)
649	HDFG:	1 chick found	21 May 1975	(8)
650	HDFG:	3	1 Aug. 1975	(2)
651	HDFG:	3	16 Jan. 1976	(2)
652	HDFG:	3	4-5 Aug. 1976	(2)
653	HDFG:	2 nests found	spring 1976	(19)
654	HDFG:	3	15 Sep. 1976	(14)
655	HDFG:	3	22 Sep. 1976	(14)
656	HDFG:	3	29 Sep. 1976	(14)
657	HDFG:	3	5 Jan. 1977	(14)
658	HDFG:	4	13 Jan. 1977	(2)
659	HDFG:	4	5 Apr. 1977	(14)
660	HDFG:	4	15 Apr. 1977	(14)
661	HDFG:	2	13 May 197	(14)
662	HDFG:	2	20 May 1977	(14)
663	HDFG:	2	26 May 1977	(14)
664	HDFG:	6	8 June 1977	(14)

665	HDFG:	5	29 June 1977	(14)
666	HDFG:	4	29 June 1977	(14)
667	HDFG:	3 nests found	spring 1977	(16)
668	HDFG:	3	27-28 Jul. 1977	(2)
669	HDFG:	3	12-13 Jan. 1978	(2)
670	HDFG:	9	27-28,30 Jul. 1978	(5)
671	HDFG:	nest found	4 Jul. 1978	(9)
672	HDFG:	0	15,16,20 Jan. 1979	(5)
673	HDFG:	1 nest found	11 May 1979	(9)
674	HDFG:	2 nests found	24 May 1979	(9)
675	HDFG:	10	1-2 Aug. 1979	(5)
676	HDFG:	5	14-16 Jan. 1980	(5)
677	HDFG:	1 chick seen	14 May 1980	(44)
678	HDFG:	3 chicks seen	31 Jul. 1980	(5)

Mana Brackish Pond

679	HDFG:	nest found	10 Apr. 1974	(8)
680	HDFG:	nest found	June 1974	(8)
681	HDFG:	2	2 Aug. 1974	(8)
682	HDFG:	0	fall survey 1974	(8)
683	HDFG:	0	winter survey 1974-75	(8)
684	HDFG:	0	spring survey 1975	(8)

685	HDFG:	4	1 Aug. 1975	(2)
686	HDFG:	0	15 Jan. 1976	(2)
687	HDFG:	1	4-5 Aug. 1976	(2)
688	HDFG:	2	15 Sep. 1976	(14)
689	HDFG:	3	19 Oct. 1976	(14)
690	HDFG:	0	13 Jan. 1977	(2)

Mana Brackish Pond

691	HDFG:	2	5 Apr. 1977	(14)
692	HDFG:	4	15 Apr. 1977	(14)
693	HDFG:	1	20 May 1977	(14)
694	HDFG:	2	26 May 1977	(14)
695	HDFG:	4	8 June 1977	(14)
696	HDFG:	4	14 June 1977	(14)
697	HDFG:	2	29 June 1977	(14)
698	HDFG:	1	27-28 Jul. 1977	(2)
699	HDFG:	0	12-13 Jan. 1978	(2)
700	HDFG:	0	27-28, 30 Jul. 1978	(5)
701	HDFG:	0	15-16, 20 Jan. 1979	(5)
702	HDFG:	2	1-2 Aug. 1979	(5)
703	HDFG:	0	14-16 Jan. 1980	(5)
704	HDFG:	3-egg nest flooded by rain	14 May 1980	(44)

Mana Ditches

705	Banko: up to 6 regularly use estimated 30 miles of ditches in 3,800 acres of cane, 40 acres of alfalfa	(1963-1965)	(17)
706	Banko: nest found in irrigation flat in middle of cane field	20 May 1967	(18)
707	HDFG: 0	12-13 Jan. 1978	(2)
708	HDFG: 2	1-2 Aug. 1979	(5)
709	HDFG: 0	14-16 Jan. 1980	(5)

Mana House Reservoir

710	HDFG: 0	summer survey 1974	(8)
711	HDFG: 0	fall survey 1974	(8)
712	HDFG: 0	winter survey 1974-75	(8)
713	HDFG: 0	spring survey 1975	(8)
714	HDFG: 2	1 Aug. 1975	(2)
715	HDFG: 0	15 Jan. 1976	(2)
716	HDFG: 1	4-5 Aug. 1976	(2)
717	HDFG: 0	13 Jan. 1977	(2)
718	HDFG: 2	27-28 Jul. 1977	(2)
719	HDFG: 0	12-13 Jan. 1978	(2)
720	HDFG: 0	27-28,30 Jul. 1979	(5)
721	HDFG: 0	15-16,20 Jan. 1979	(5)
722	HDFG: 0	1-2 Aug. 1979	(5)

723	HDFG: 0	14-16 Jan. 1980	(5)
Mana Pastures			
724	Banko: up to 50 in summer	1966	(11)
725	HDFG: 2	24 Jul. 1969	(1)
726	USFWS: 37	14 Sep. 1970	(12)
727	HDFG: 11	12 Apr. 1972	(12)
728	HDFG: 14	8 Aug. 1973	(1)
Mana Rservoir			
729	HDFG: 0	24 Jul. 1969	(1)
730	HDFG: 0	summer survey 1974	(8)
731	HDFG: 0	fall survey 1974	(8)
732	HDFG: 0	winter survey 1974-75	(8)
733	HDFG: 0	spring survey 1975	(8)
734	HDFG: 0	1 Aug. 1975	(2)
735	HDFG: 0	15 Jan. 1976	(2)
736	HDFG: 0	4-5 Aug. 1976	(2)
737	HDFG: 0	13 Jan. 1977	(2)
738	HDFG: 0	27-28 Jul. 1977	(2)
739	HDFG: 0	12-13 Jan. 1978	(2)
740	HDFG: 0	15-16, 20 Jan. 1979	(5)
741	HDFG: 0	1-2 Aug. 1979	(5)

742	HDFG:	0	14-16 Jan. 1980	(5)
743	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
744	HDFG:	0	12 Jan. 1981	(5)

Niu Valley Reservoir

745	HDFG:	0	15 Jan. 1976	(2)
746	HDFG:	0	4-5 Aug. 1976	(2)
747	HDFG:	0	13 Jan. 1977	(2)
748	HDFG:	0	27-28 Jul. 1977	(2)
749	HDFG:	1	12-13 Jan. 1978	(2)
750	HDFG:	0	27-28, 30 Jul. 1979	(5)
751	HDFG:	0	15-16, 20 Jan. 1979	(5)
752	HDFG:	0	1-2 Aug. 1979	(5)
753	HDFG:	0	14-16 Jan. 1980	(5)

Waiawa Reservoir

754	HDFG:	0	summer survey 1974	(8)
755	HDFG:	1	8 Nov. 1974	(8)
756	HDFG:	0	winter survey 1974-75	(8)
757	HDFG:	0	spring survey 1975	(8)
758	HDFG:	6	1 Aug. 1975	(2)
759	HDFG:	0	15 Jan. 1976	(2)
760	HDFG:	1	4-5 Aug. 1976	(2)

761	HDFG:	0	13 Jan. 1977	(2)
762	HDFG:	0	27-28 Jul. 1977	(2)
763	HDFG:	0	12-13 Jan. 1978	(3)
764	HDFG:	0	27-28,30 Jul. 1979	(5)
765	HDFG:	0	15-16,20 Jan. 1979	(5)
766	HDFG:	0	1-2 Aug. 1979	(5)
767	HDFG:	0	14-16 Jan. 1980	(5)

Wailua Siphon Reservoir

768	HDFG:	0	4-5 Aug. 1976	(2)
769	HDFG:	0	13 Jan. 1977	(2)
770	HDFG:	0	27-28 Jul. 1977	(2)
771	HDFG:	0	15-16,20 Jan. 1979	(5)
772	HDFG:	0	1-2 Aug. 1979	(5)
773	HDFG:	0	14-16 Jan. 1980	(5)

Waimea Heights Reservoir

774	HDFG:	0	1 Aug. 1975	(2)
775	HDFG:	0	15 Jan. 1976	(2)
776	HDFG:	0	4-5 Aug. 1976	(2)
777	HDFG:	0	13 Jan. 1977	(2)
778	HDFG:	0	27-28 Jul. 1977	(2)
779	HDFG:	0	12-13 Jan. 1978	(2)

780	HDFG:	0	15-16,20 Jan. 1979	(5)
781	HDFG:	0	1-2 Aug. 1979	(5)
782	HDFG:	0	14-16 Jan. 1980	(5)

WAIMEA CANYON

Kepani Reservoir

783	HDFG:	0	14 Jan. 1981	(5)
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KAPAA

Aii Reservoir

784	HDFG:	0	1 Aug. 1975	(2)
785	HDFG:	0	15 Jan. 1976	(2)
786	HDFG:	0	4-5 Aug. 1976	(2)
787	HDFG:	0	13 Jan. 1977	(2)
788	HDFG:	0	27-28 Jul. 1977	(2)
789	HDFG:	0	12-13 Jan. 1978	(2)
790	HDFG:	0	27-28, 30 Jul. 1978	(5)
791	HDFG:	0	15-16,20 Jan. 1979	(5)
792	HDFG:	0	1-2 Aug. 1979	(5)
793	HDFG:	0	14-16 Jan. 1980	(5)
794	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
795	HDFG:	0	12 Jan. 1981	(5)

DeMello Reservoir

796	HDFG:	0	1 Aug. 1975	(2)
797	HDFG:	0	15 Jan. 1976	(2)
798	HDFG:	0	4-5 Aug. 1976	(2)
799	HDFG:	0	13 Jan. 1977	(2)
800	HDFG:	0	27-28 Jul. 1977	(2)
801	HDFG:	0	12-13 Jan. 1978	(2)
802	HDFG:	0	15-16, 20 Jan. 1979	(5)
803	HDFG:	0	1-2 Aug. 1979	(5)
804	HDFG:	0	14-16 Jan. 1980	(5)
805	HDFG:	0	1 Aug. 1980	(5)
806	HDFG:	0	12 Jan. 1981	(5)

Fern Grotto Reservoir

807	HDFG:	0	1 Aug. 1975	(2)
808	HDFG:	0	15 Jan. 1976	(2)
809	HDFG:	0	4-5 Aug. 1976	(2)
810	HDFG:	0	13 Jan. 1977	(2)
811	HDFG:	0	27-28 Jul. 1977	(2)
812	HDFG:	0	12-13 Jan. 1978	(2)
813	HDFG:	0	15-16, 20 Jan. 1979	(5)
814	HDFG:	0	1-2 Aug. 1979	(5)

815	HDFG:	0	14-16 Jan. 1980	(5)
816	HDFG:	0	12 Jan. 1981	(5)

Halaula Reservoir

817	HDFG:	0	1 Aug. 1975	(2)
818	HDFG:	0	15 Jan. 1976	(2)
819	HDFG:	0	13 Jan. 1977	(2)
820	HDFG:	0	27-28 Jul. 1977	(2)
821	HDFG:	0	12-13 Jan. 1978	(2)
822	HDFG:	0	15-16,20 Jan. 1979	(5)
823	HDFG:	0	1-2 Aug. 1979	(5)
824	HDFG:	0	14-16 Jan. 1980	(5)

Hanahanapuni Reservoir #429

825	HDFG:	0	1 Aug. 1975	(2)
826	HDFG:	0	15 Jan. 1976	(2)
827	HDFG:	0	4-5 Aug. 1976	(2)
828	HDFG:	0	13 Jan. 1977	(2)
829	HDFG:	0	27-28 Jul. 1977	(2)
830	HDFG:	0	12-13 Jan. 1978	(2)
831	HDFG:	0	27-28,30 Jul. 1978	(5)
832	HDFG:	0	15-16,20 Jan. 1979	(5)
833	HDFG:	0	1-2 Aug. 1979	(5)

834	HDFG:	0	12 Jan. 1981	(5)
Hanamaulu Reservoir				
835	HDFG:	0	1 Aug. 1975	(2)
836	HDFG:	0	15 Jan. 1976	(2)
837	HDFG:	0	4-5 Aug. 1976	(2)
838	HDFG:	0	13 Jan. 1977	(2)
839	Shallenberger:	4	17 May 1977	(3)
840	Shallenberger:	0 (after open water had disappeared)	21 Jul. 1977	(3)
841	HDFG:	0	27-28 Jul. 1977	(2)
842	HDFG:	0	12-13 Jan. 1978	(2)
843	HDFG:	0	27-28, 30 Jul. 1978	(5)
844	HDFG:	0	15-16, 20 Jan. 1979	(5)
845	HDFG:	0	1-2 Aug. 1979	(5)
846	HDFG:	0	14-16 Jan. 1980	(5)
847	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
848	HDFG:	0	12 Jan. 1981	(5)
Hanamaulu Air Strip Reservoir (year drained unknown)				
849	HDFG:	0	1 Aug. 1975	(2)
850	HDFG:	0	15 Jan. 1976	(2)
851	HDFG:	0	27-28 Jul. 1977	(2)

852	HDFG:	0	12-13 Jan. 1978	(2)
853	HDFG:	0	27-28, 30 July 1978	(5)
854	HDFG:	0	15-16,20 Jan. 1979	(5)
855	HDFG:	0	14-16 Jan. 1980	(5)
856	HDFG:	0	12 Jan. 1981	(5)

Kailliliahinale Reservoir

857	HDFG:	0	1 Aug. 1975	(2)
858	HDFG:	0	15 Jan. 1976	(2)
859	HDFG:	0	4-5 Aug. 1976	(2)
860	HDFG:	0	13 Jan. 1977	(2)
861	HDFG:	0	27-28 Jul. 1977	(2)
862	HDFG:	0	12-13 Jan. 1978	(2)
863	HDFG:	0	27-28, 30 Jul. 1978	(5)
864	HDFG:	0	15-16,20 Jan. 1979	(5)
865	HDFG:	0	1-2 Aug. 1979	(5)
866	HDFG:	0	14-16 Jan. 1980	(5)

Kapaa Stable Reservoir

867	HDFG:	0	1 Aug. 1975	(2)
868	HDFG:	0	15 Jan. 1976	(2)
869	HDFG:	0	4-5 Aug. 1976	(2)
870	HDFG:	0	13 Jan. 1977	(2)

871	HDFG:	0	27-28 Jul. 1977	(2)
872	HDFG:	0	12-13 Jan. 1978	(2)
873	HDFG:	0	15-16,20 Jan. 1979	(5)
874	HDFG:	0	1-2 Aug. 1979	(5)
875	HDFG:	0	14-16 Jan. 1980	(5)

Kapaa Stream Estuary

876	HDFG:	0	1 Aug. 1975	(2)
877	HDFG:	0	15 Jan. 1976	(2)
878	HDFG:	0	4-5 Aug. 1976	(2)
879	HDFG:	0	13 Jan. 1977	(2)
880	HDFG:	0	27-28 Jul. 1977	(2)
881	HDFG:	0	12-13 Jan. 1978	(2)
882	HDFG:	0	15-16,20 Jan. 1979	(5)
883	HDFG:	0	1-2 Aug. 1979	(5)
884	HDFG:	0	14-16 Jan. 1980	(5)
885	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
886	HDFG:	0	12 Jan. 1981	(5)

Kapahi Pastures

887	HDFG:	0	4-5 Aug. 1976	(2)
888	HDFG:	0	13 Jan. 1977	(2)
889	HDFG:	0	27-28 Jul. 1977	(2)

890	HDFG:	0	12-13 Jan. 1978	(2)
891	HDFG:	0	27-28,30 Jul. 1978	(5)
892	HDFG:	0	1-2 Aug. 1979	(5)
893	HDFG:	0	14-16 Jan. 1980	(5)

Kapaia Reservoir

894	HDFG:	0	1 Aug. 1975	(2)
895	HDFG:	0	15 Jan. 1976	(2)
896	HDFG:	0	4-5 Aug. 1976	(2)
897	HDFG:	0	13 Jan. 1977	(2)
898	HDFG:	0	27-28 Jul. 1977	(2)
899	HDFG:	0	12-13 Jan. 1978	(2)
900	HDFG:	0	15-16,20 Jan. 1979	(5)
901	HDFG:	0	1-2 Aug. 1979	(5)
902	HDFG:	0	14-16 Jan. 1980	(5)
903	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Lono Reservoir

904	HDFG:	0	1 Aug. 1975	(2)
905	HDFG:	0	15 Jan. 1976	(2)
906	HDFG:	0	4-5 Aug. 1976	(2)
907	HDFG:	0	13 Jan. 1977	(2)
908	HDFG:	0	27-28 Jul. 1977	(2)

909	HDFG:	0	12-13 Jan. 1978	(2)
910	HDFG:	0	15-16,20 Jan. 1979	(5)
911	HDFG:	0	1-2 Aug. 1979	(5)
912	HDFG:	0	14-16 Jan. 1980	(5)
913	HDFG:	0	12 Jan. 1981	(5)

Moikeha Canal

914	HDFG:	0	1 Aug. 1975	(2)
915	HDFG:	0	15 Jan. 1976	(2)
916	HDFG:	0	13 Jan. 1977	(2)
917	HDFG:	0	27-28 Jul. 1977	(2)
918	HDFG:	0	12-13 Jan. 1978	(2)
919	HDFG:	0	15-16,20 Jan. 1979	(5)
920	HDFG:	0	1-2 Aug. 1979	(5)
921	HDFG:	0	14-16 Jan. 1980	(5)
922	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
923	HDFG:	0	12 Jan. 1981	(5)

Moikeha Reservoir

924	HDFG:	0	4-5 Aug. 1976	(2)
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Opaekaa Valley

925	HDFG:	1	24 Jul. 1968	(1)
926	HDFG:	0	12 Apr. 1972	(1)

927	HDFG:	0	summer survey 1974	(8)
928	HDFG:	0	fall survey 1974	(8)
929	HDFG:	0	winter survey 1974-75	(8)
930	HDFG:	0	spring survey 1975	(8)
931	HDFG:	0	1 Aug. 1975	(2)
932	HDFG:	0	15 Jan. 1976	(2)
933	HDFG:	3	4-5 Aug. 1976	(2)
934	HDFG:	3	13 Jan. 1977	(2)
935	Shallenberger:	7	23 Jul. 1977	(3)
936	HDFG:	0	27-28 Jul. 1977	(2)
937	HDFG:	4	12-13 Jan. 1978	(2)
938	HDFG:	2	27-28, 30 Jul. 1978	(5)
939	HDFG:	0	15-16, 20 Jan. 1979	(5)
940	HDFG:	2	1-2 Aug. 1979	(5)
941	HDFG:	0	14-16 Jan. 1980	(5)

Paradise Pacifica

942	HDFG:	0	1 Aug. 1975	(2)
943	HDFG:	0	15 Jan. 1976	(2)
944	HDFG:	0	4-5 Aug. 1976	(2)
945	HDFG:	0	13 Jan. 1977	(2)
946	Shallenberger:	0	23 Jul. 1977	(3)

947	HDFG:	0	27-28 Jul. 1977	(2)
948	HDFG:	0	12-13 Jan. 1978	(2)
949	HDFG:	0	27-28, 30 Jul. 1978	(5)
950	HDFG:	0	15-16,20 Jan. 1979	(5)
951	HDFG:	0	1-2 Aug. 1979	(5)
952	HDFG:	0	14-16 Jan. 1980	(5)

Pukaki Reservoir

953	HDFG:	0	1 Aug. 1975	(2)
954	HDFG:	0	15 Jan. 1976	(2)
955	HDFG:	0	4-5 Aug. 1976	(2)
956	HDFG:	0	13 Jan. 1977	(2)
957	HDFG:	0	27-28 Jul. 1977	(2)
958	HDFG:	0	12-13 Jan. 1978	(2)
959	HDFG:	0	15-16,20 Jan. 1979	(5)
960	HDFG:	0	1-2 Aug. 1979	(5)
961	HDFG:	2	14-16 Jan. 1980	(5)
962	HDFG:	0	12 Jan. 1981	(5)

Rodrigues Reservoir

963	HDFG:	0	1 Aug. 1975	(2)
964	HDFG:	0	15 Jan. 1976	(2)
965	HDFG:	0	4-5 Aug. 1976	(2)

966	HDFG:	0	13 Jan. 1977	(2)
967	HDFG:	0	27-28 Jul. 1977	(2)
968	HDFG:	0	12-13 Jan. 1978	(2)
969	HDFG:	0	15-16,20 Jan. 1979	(5)
970	HDFG:	0	1-2 Aug. 1979	(5)
971	HDFG:	0	14-16 Jan. 1980	(5)
972	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
973	HDFG:	0	12 Jan. 1981	(5)

Sloggett (Wailua) Reservoir

974	HDFG:	0	24 Jul. 1969	(1)
975	HDFG:	2	9 Aug. 1973	(8)
976	HDFG:	0	15 Nov. 1973	(8)
977	HDFG:	0	10 Apr. 1974	(8)
978	HDFG:	0	summer survey 1974	(8)
979	HDFG:	0	fall survey 1974	(8)
980	HDFG:	0	winter survey 1974-75	(8)
981	HDFG:	0	spring survey 1975	(8)
982	HDFG:	1	1 Aug. 1975	(2)
983	HDFG:	0	15 Jan. 1976	(2)
984	HDFG:	0	4-5 Aug. 1976	(2)
985	HDFG:	0	13 Jan. 1977	(2)

986	HDFG:	0	27-28 Jul. 1977	(2)
987	HDFG:	0	12-13 Jan. 1978	(2)
988	HDFG:	0	27-28, 30 Jul. 1978	(5)
989	HDFG:	0	15-16,20 Jan. 1979	(5)
990	HDFG:	0	1-2 Aug. 1979	(5)
991	HDFG:	0	14-16 Jan. 1980	(5)

Twin Reservoirs

992	HDFG:	0	1 Aug. 1975	(2)
993	HDFG:	0	15 Jan. 1976	(2)
994	HDFG:	0	4-5 Aug. 1976	(2)
995	HDFG:	0	13 Jan. 1977	(2)
996	HDFG:	0	27-28 Jul. 1977	(2)
997	HDFG:	0	12-13 Jan. 1978	(2)
998	HDFG:	0	15-16,20 Jan. 1979	(5)
999	HDFG:	0	1-2 Aug. 1979	(5)
1000	HDFG:	0	14-16 Jan. 1980	(5)
1001	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1002	HDFG:	0	12 Jan. 1981	(5)

Waikaea Canal

1003	HDFG:	0	1 Aug. 1975	(2)
1004	HDFG:	0	15 Jan. 1976	(2)

1005	HDFG:	0	4-5 Aug. 1976	(2)
1006	HDFG:	0	13 Jan. 1977	(2)
1007	HDFG:	0	27-28 Jul. 1977	(2)
1008	HDFG:	0	12-13 Jan. 1978	(2)
1009	HDFG:	0	15-16,20 Jan. 1979	(5)
1010	HDFG:	0	1-2 Aug. 1979	(5)
1011	HDFG:	0	14-16 Jan. 1980	(5)
1012	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1013	HDFG:	0	12 Jan. 1981	(5)

Wailua Golf Course

1014	HDFG:	0	1 Aug. 1975	(2)
1015	HDFG:	0	15 Jan. 1976	(2)
1016	HDFG:	0	4-5 Aug. 1976	(2)
1017	HDFG:	0	13 Jan. 1977	(2)
1018	HDFG:	0	27-28 Jul. 1977	(2)
1019	HDFG:	0	12-13 Jan. 1978	(5)
1020	HDFG:	0	15-16,20 Jan. 1979	(5)
1021	HDFG:	0	1-2 Aug. 1979	(5)
1022	HDFG:	0	14-16 Jan. 1980	(5)
1023	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1024	HDFG:	0	12 Jan. 1981	(5)

Wailua Homestead Pastures

1025	HDFG:	0	4-5 Aug. 1976	(2)
1026	HDFG:	0	13 Jan. 1977	(2)
1027	HDFG:	0	12-13 Jan. 1978	(2)
1028	HDFG:	0	27-28,30 Jul. 1979	(5)
1029	HDFG:	0	1-2 Aug. 1979	(5)
1030	HDFG:	0	14-16 Jan. 1980	(5)

Wailua Jail Swamp

1031	HDFG:	0	1 Aug. 1975	(2)
1032	HDFG:	0	15 Jan. 1976	(2)
1033	HDFG:	0	4-5 Aug. 1976	(2)
1034	HDFG:	0	13 Jan. 1977	(2)
1035	HDFG:	0	27-28 Jul. 1977	(2)
1036	HDFG:	0	12-13 Jan. 1978	(2)
1037	HDFG:	0	15-16,20 Jan. 1979	(5)
1038	HDFG:	0	1-2 Aug. 1979	(5)
1039	HDFG:	0	14-16 Jan. 1980	(5)
1040	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1041	HDFG:	0	12 Jan. 1981	(5)

HANAPEPE

Aaka Reservoir

1042	HDFG:	0	1 Aug. 1975	(2)
1043	HDFG:	0	15 Jan. 1976	(2)
1044	HDFG:	0	4-5 Aug. 1976	(2)
1045	HDFG:	0	13 Jan. 1977	(2)
1046	HDFG:	0	27-28 Jul. 1977	(2)
1047	HDFG:	0	12-13 Jan. 1978	(2)
1048	HDFG:	0	14 Jan. 1981	(5)

Alexander Reservoir

1049	HDFG:	0	1 Aug. 1975	(2)
1050	HDFG:	0	4-5 Aug. 1976	(2)
1051	HDFG:	0	13 Jan. 1977	(2)
1052	HDFG:	0	27-28 Jul. 1977	(2)
1053	HDFG:	0	12-13 Jan. 1978	(2)
1054	HDFG:	0	1-2 Aug. 1979	(5)
1055	HDFG:	0	1 Aug. 1980	(5)
1056	HDFG:	0	14 Jan. 1981	(5)

Ekahi Reservoir

1057	HDFG:	0	1 Aug. 1975	(2)
1058	HDFG:	0	15 Jan. 1976	(2)

1059	HDFG:	0	4-5 Aug. 1976	(2)
1060	HDFG:	0 (permanently dried up)	13 Jan. 1977	(2)
1061	HDFG:	0	15-16,20 Jan. 1979	(5)
1062	HDFG:	0	12 Jan. 1981	(5)

Elima Reservoir

1063	HDFG:	0	1 Aug. 1975	(2)
1064	HDFG:	0	15 Jan. 1976	(2)
1065	HDFG:	0	4-5 Aug. 1976	(2)
1066	HDFG:	0	13 Jan. 1977	(2)
1067	HDFG:	0	27-28 Jul. 1977	(2)
1068	HDFG:	0	12-13 Jan. 1978	(2)
1069	HDFG:	0	15-16,20 Jan. 1979	(5)
1070	HDFG:	0	1-2 Aug. 1979	(5)
1071	HDFG:	0	14-16 Jan. 1980	(5)
1072	HDFG:	0	12 Jan. 1981	(5)

Elua Reservoir

1073	HDFG:	0	1 Aug. 1975	(2)
1074	HDFG:	0	15 Jan. 1976	(2)
1075	HDFG:	0	4-5 Aug. 1976	(2)
1076	HDFG:	0	13 Jan. 1977	(2)
1077	HDFG:	0	27-28 Jul. 1977	(2)

1078	HDFG:	0	12-13 Jan. 1978	(2)
1079	HDFG:	0	15-16, 20 Jan. 1979	(5)
1080	HDFG:	0	1-2 Aug. 1979	(5)
1081	HDFG:	0	14-16 Jan. 1980	(5)
1082	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Hanapepe Salt Pond

1083	USFWS:	23	8 Sept. 1964	(12)
1084	0	seen	6 Agu. 1965	DONW65a
1085	Banko:	up to 40	(1966)	(17)
1086	HDFG:	4	8-10 Jan. 1968	(1)
1087	HDFG:	0 (dry)	24 Jul. 1968	(1)
1088	USFWS:	0	13 Oct. 1968	(12)
1089	USFWS:	0	16 Oct. 1968	(12)
1090	HDFG:	8	13-14 Jan. 1969	(1)
1091	HDFG:	3	24 Jul. 1969	(1)
1092	HDFG:	10	30 Nov. 1970	(8)
1093	HDFG:	16	12 Jan. 1971	(8)
1094	HDFG:	0	22 Apr. 1971	(8)
1095	HDFG:	15	27 Jul. 1971	(8)
1096	HDFG:	0	7 Aug. 1971	(8)
1097	HDFG:	37	9 Nov. 1971	(8)

1098	HDFG:	0	29 Feb. 1972	(8)
1099	HDFG:	8	12 Apr. 1972	(8)
1100	HDFG:	0	3 Aug. 1972	(8)
1101	HDFG:	6	11 Nov. 1972	(8)
1102	HDFG:	26	18 Jan. 1973	(8)
1103	HDFG:	0	17 Apr. 1973	(8)
1104	HDFG:	0	9 Aug. 1973	(8)
1105	HDFG:	6	15 Nov. 1973	(8)
1106	HDFG:	0	15 Jan. 1974	(8)
1107	HDFG:	0	10 Apr. 1974	(8)
1108	HDFG:	0	summer survey 1974	(8)
1109	HDFG:	0	fall survey 1975	(8)
1110	HDFG:	13	22-23 Jan. 1975	(8)
1111	HDFG:	0	spring survey 1975	(8)
1112	HDFG:	0	1 Aug. 1975	(2)
1113	HDFG:	0	15 Jan. 1976	(2)
1114	HDFG:	0	4-5 Aug. 1976	(2)
1115	HDFG:	0	13 Jan. 1977	(3)
1116	Shallenberger:	0 (high water)	20 Jul. 1977	(3)
1117	Shallenberger:	2 (nearly dry)...count records for recent years show as many as 26...accounting for as much as 35% of the island total for the species on count days. When one considers that	20 Jul. 1977	(3)

this species may be recorded at less than a half dozen habitats on winter counts, the long range significance of Hanapepe for stilt on Kaua'i becomes apparent.

1118	HDFG:	0	27-28 Jul. 1977	(2)
1119	HDFG:	4	12-13 Jan. 1978	(2)
1120	HDFG:	0	27-28, 30 Jul. 1978	(5)
1121	HDFG:	0	15-16, 20 Jan. 1979	(5)
1122	HDFG:	2	1-2 Aug. 1979	(5)
1123	HDFG:	4	14-16 Jan. 1980	(5)

Hanapepe Taro Fields

1124	HDFG:	0	24 Jul. 1968	(1)
1125	HDFG:	6	27 Jul. 1971	(8)
1126	HDFG:	0	1 Aug. 1975	(2)
1127	HDFG:	0	15 Jan. 1976	(2)
1128	HDFG:	0	4-5 Aug. 1976	(2)
1129	HDFG:	0	13 Jan. 1977	(2)
1130	HDFG:	0	27-28 Jul. 1977	(2)
1131	HDFG:	0	12-13 Jan. 1978	(2)
1132	HDFG:	2	27-28, 30 Jul. 1978	(5)
1133	HDFG:	0	15-16, 20 Jan. 1979	(5)
1134	HDFG:	0	1-2 Aug. 1979	(5)
1135	HDFG:	0	14-16 Jan. 1980	(5)

1136 HDFG: 0 31 Jul., 1 Aug. 1980 (5)

Hukiwai Reservoir

1137 HDFG: 0 1 Aug. 1975 (2)

1138 HDFG: 0 15 Jan. 1976 (2)

1139 HDFG: 0 4-5 Aug. 1976 (2)

1140 HDFG: 0 13 Jan. 1977 (2)

1141 HDFG: 0 27-28 Jul. 1977 (2)

1142 HDFG: 0 12-13 Jan. 1978 (2)

1143 HDFG: 0 27-28, 30 Jul. 1978 (5)

1144 HDFG: 0 15-16, 20 Jan. 1979 (5)

1145 HDFG: 0 1-2 Aug. 1979 (5)

1146 HDFG: 0 14-16 Jan. 1980 (5)

Ioleau Reservoir

1147 HDFG: 0 15 Jan. 1976 (2)

1148 HDFG: 0 4-5 Aug. 1976 (2)

1149 HDFG: 0 13 Jan. 1977 (2)

1150 HDFG: 0 27-28 Jul. 1977 (2)

1151 HDFG: 0 12-13 Jan. 1978 (5)

1152 HDFG: 0 27-28, 30 Jul. 1978 (5)

1153 HDFG: 0 15-16, 20 Jan. 1979 (5)

1154 HDFG: 0 1 Aug. 1979 (5)

1155	HDFG:	0	14-16 Jan. 1980	(5)
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1156	HDFG:	0	12 Jan. 1981	(5)
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Ipuolono Reservoir

1157	HDFG:	0	1 Aug. 1975	(2)
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1158	HDFG:	0	15 Jan. 1976	(2)
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1159	HDFG:	0	4-5 Aug. 1976	(2)
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1160	HDFG:	0	13 Jan. 1977	(2)
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1161	HDFG:	0	27-28 Jul. 1977	(2)
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1162	HDFG:	0	12-13 Jan. 1978	(5)
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1163	HDFG:	0	27-28, 30 Jul. 1978	(2)
------	-------	---	---------------------	-----

1164	HDFG:	0	15-16, 20 Jan. 1979	(5)
------	-------	---	---------------------	-----

1165	HDFG:	0	1-2 Aug. 1979	(5)
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1166	HDFG:	0	14-16 Jan. 1980	(5)
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1167	HDFG:	0	12 Jan. 1981	(5)
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Kaawanui Reservoir

1168	HDFG:	0	1 Aug. 1975	(2)
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1169	HDFG:	0	15 Jan. 1976	(2)
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1170	HDFG:	0	4-5 Aug. 1976	(2)
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1171	HDFG:	0	13 Jan. 1977	(2)
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1172	HDFG:	0	27-28 Jul. 1977	(2)
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1173	HDFG:	0	12-13 Jan. 1978	(5)
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1174	HDFG:	0	1-2 Aug. 1979	(5)
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Kalaeloa Reservoir

1175	HDFG:	0	1 Aug. 1975	(2)
------	-------	---	-------------	-----

1176	HDFG:	0	15 Jan. 1976	(2)
------	-------	---	--------------	-----

1177	HDFG:	0	4-5 Aug. 1976	(2)
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1178	HDFG:	0	13 Jan. 1977	(2)
------	-------	---	--------------	-----

1179	HDFG:	0	27-28 Jul. 1977	(2)
------	-------	---	-----------------	-----

1180	HDFG:	0	12-13 Jan. 1978	(5)
------	-------	---	-----------------	-----

1181	HDFG:	0	1-2 Aug. 1979	(5)
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Kalaheo Gulches Reservoirs

1182	HDFG:	0	15 Jan. 1976	(2)
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1183	Shallenberger: maximum of 4 seen in all ponds taken together...during two visits		(1977)	(3)
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Kapa Reservoir

1184	HDFG:	0	1 Aug. 1975	(2)
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1185	HDFG:	0	15 Jan. 1976	(2)
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1186	HDFG:	0	4-5 Aug. 1976	(2)
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1187	HDFG:	0	13 Jan. 1977	(2)
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1188	HDFG:	0	27-28 Jul. 1977	(2)
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1189	HDFG:	0	12-13 Jan. 1978	(2)
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1190	HDFG:	0	15-16, 20 Jan. 1979	(5)
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1191	HDFG:	0	1-2 Aug. 1979	(5)
1192	HDFG:	0	14-16 Jan. 1980	(5)
1193	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Kaumakani Gulch

1194	HDFG:	2	24 Jul. 1969	(1)
1195	HDFG:	0	1 Aug. 1975	(2)
1196	HDFG:	0	15 Jan. 1976	(2)
1197	HDFG:	34	4-5 Aug. 1976	(2)
1198	HDFG:	0	13 Jan. 1977	(2)
1199	HDFG:	2	27-28 Jul. 1977	(2)
1200	HDFG:	0	12-13 Jan. 1978	(2)
1201	HDFG:	3	27-28, 30 Jul. 1978	(5)
1202	HDFG:	0	15-16, 20 Jan. 1979	(5)
1203	HDFG:	0	1-2 Aug. 1979	(5)
1204	HDFG:	0	14-16 Jan. 1980	(5)
1205	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1206	HDFG:	0	12 Jan. 1981	(5)

Kiaha Reservoir (year filled in unknown)

1207	HDFG:	0	1 Aug. 1975	(2)
1208	HDFG:	0	15 Jan. 1976	(2)

1209	HDFG:	0	4-5 Aug. 1976	(2)
1210	HDFG:	0	13 Jan. 1977	(2)
1211	HDFG:	0	27-28 Jul. 1977	(2)
1212	HDFG:	0	12-13 Jan. 1978	(2)
1213	HDFG:	0	27-28, 30 Jul. 1978	(5)
1214	HDFG:	0	15-16, 20 Jan. 1979	(5)
1215	HDFG:	0	1-2 Aug. 1979	(5)
1216	HDFG:	0	14-16 Jan. 1980	(5)
1217	HDFG:	0	12 Jan. 1981	(5)

Maele Reservoir

1218	HDFG:	0	15 Jan. 1976	(2)
1219	HDFG:	0	4-5 Aug. 1976	(2)
1220	HDFG:	0	13 Jan. 1977	(2)
1221	HDFG:	0	27-28 Jul. 1977	(2)
1222	HDFG:	0	12-13 Jan. 1978	(2)
1223	HDFG:	0	15-16, 20 Jan. 1979	(5)
1224	HDFG:	0	1-2 Aug. 1979	(5)
1225	HDFG:	0	14-16 Jan. 1980	(5)
1226	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1227	HDFG:	0	12 Jan. 1981	(5)

Manienieula Reservoir

1228	HDFG:	2	1 Aug. 1975	(2)
1229	HDFG:	0	15 Jan. 1976	(2)
1230	HDFG:	5	4-5 Aug. 1976	(2)
1231	HDFG:	3	13 Jan. 1977	(2)
1232	HDFG:	22	27-28 Jul. 1977	(2)
1233	HDFG:	0	12-13 Jan. 1978	(2)
1234	HDFG:	4	27-28, 30 Jul. 1978	(5)
1235	HDFG:	0	15-16, 20 Jan. 1979	(5)
1236	HDFG:	3	1-2 Aug. 1979	(5)
1237	HDFG:	0	14-16 Jan. 1980	(5)

Mau Reservoir

1238	HDFG:	0	1 Aug. 1975	(2)
1239	HDFG:	0	15 Jan. 1976	(2)
1240	HDFG:	0	4-5 Aug. 1976	(2)
1241	HDFG:	0	13 Jan. 1977	(2)
1242	HDFG:	0	27-28 Jul. 1977	(2)
1243	HDFG:	0	12-13 Jan. 1978	(2)
1244	HDFG:	0	15-16, 20 Jan. 1979	(5)
1245	HDFG:	0	1-2 Aug. 1979	(5)
1246	HDFG:	0	14-16 Jan. 1980	(5)

1247 HDFG: 0 31 Jul., 1 Aug. 1980 (5)

Nomilo Fish Pond

1248 HDFG: 0 4-5 Aug. 1976 (2)

1249 HDFG: 0 13 Jan. 1977 (2)

1250 Shallenberger: 1 seen 1 Jun. 1977 (3)

1251 HDFG: 0 27-28 Jul. 1977 (2)

1252 HDFG: 0 12-13 Jan. 1978 (2)

1253 HDFG: 0 15-16, 20 Jan. 1979 (5)

1254 HDFG: 0 1-2 Aug. 1979 (5)

1255 HDFG: 0 14-16 Jan. 1980 (5)

1256 HDFG: 0 31 Jul., 1 Aug. 1980 (5)

1257 HDFG: 0 12 Jan. 1981 (5)

Nonopahu Reservoir

1258 HDFG: 2 1 Aug. 1975 (2)

1259 HDFG: 0 15 Jan. 1976 (2)

1260 HDFG: 0 4-5 Aug. 1976 (2)

1261 HDFG: 0 13 Jan. 1977 (2)

1262 HDFG: 2 27-28 Jul. 1977 (2)

1263 HDFG: 0 12-13 Jan. 1978 (2)

1264 HDFG: 0 1-2 Aug. 1979 (5)

1265 HDFG: 0 1 Aug. 1980 (2)

1266	HDFG: 0	14 Jan. 1981	(2)
Olokele Settling Basin			
1267	HDFG: 7	24 Jul. 1968	(1)
1268	HDFG: 10	24 Jul. 1971	(1)
1269	HDFG: 0	12 Apr. 1972	(1)
1270	HDFG: 0	summer survey 1974	(8)
1271	HDFG: 0	fall survey 1974	(8)
1272	HDFG: 0	winter survey 1974-75	(8)
1273	HDFG: 0	spring survey 1975	(8)
1274	HDFG: 0	1 Aug. 1975	(2)
1275	HDFG: 0	15 Jan. 1976	(2)
1276	HDFG: 34	4-5 Aug. 1976	(2)
1277	HDFG: 0	13 Jan. 1977	(2)
1278	HDFG: 2	27-28 Jul. 1977	(2)
1279	HDFG: 0	12-13 Jan. 1978	(2)
1280	HDFG: 0	15-16, 20 Jan. 1979	(5)
1281	HDFG: 0	1-2 Aug. 1979	(5)
1282	HDFG: 0	14-16 Jan. 1980	(5)
1283	HDFG: 0	31 Jul., 1 Aug. 1980	(5)
1284	HDFG: 0	12 Jan. 1981	(5)

Poopueo Reservoir

1285	HDFG:	0	1 Aug. 1975	(2)
1286	HDFG:	0	15 Jan. 1976	(2)
1287	HDFG:	0	5-6 Aug. 1976	(2)
1288	HDFG:	0	13 Jan. 1977	(2)
1289	HDFG:	0	27-28 Jul. 1977	(2)
1290	HDFG:	0	12-13 Jan. 1978	(2)
1291	HDFG:	0	1-2 Aug. 1979	(5)
1292	HDFG:	0	14-16 Jan. 1980	(5)
1293	HDFG:	0	1 Aug. 1980	(5)

Pulani Reservoir

1294	HDFG:	0	1 Aug. 1975	(2)
1295	HDFG:	0	15 Jan. 1976	(2)
1296	HDFG:	0	4-5 Aug. 1976	(2)
1297	HDFG:	0	13 Jan. 1977	(2)
1298	HDFG:	0	27-28 Jul. 1977	(2)
1299	HDFG:	1	12-13 Jan. 1978	(2)
1300	HDFG:	0	27-28, 30 Jul. 1978	(5)

Puu O Papai Reservoir

1301	HDFG:	10	1 Aug. 1975	(2)
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1302	HDFG:	2	15 Jan. 1976	(2)
1303	HDFG:	4	4-5 Aug. 1976	(2)
1304	HDFG:	3	13 Jan. 1977	(2)
1305	HDFG:	6	27-28 Jul. 1977	(2)
1306	HDFG:	0	12-13 Jan. 1978	(2)
1307	HDFG:	5	27-28, 30 Jul. 1978	(5)
1308	HDFG:	0	15-16, 20 Jan. 1979	(5)
1309	HDFG:	6	1-2 Aug. 1979	(5)
1310	HDFG:	0	14-16 Jan. 1980	(5)
1311	HDFG:	0	12 Jan. 1981	(5)
Umi Reservoir				
1312	HDFG:	0	1 Aug. 1975	(2)
1313	HDFG:	0	15 Jan. 1976	(2)
1314	HDFG:	0	4-5 Aug. 1976	(2)
1315	HDFG:	0	13 Jan. 1977	(2)
1316	HDFG:	0	27-28 Jul. 1977	(2)
1317	HDFG:	0	12-13 Jan. 1978	(2)
1318	HDFG:	0	15-16, 20 Jan. 1979	(5)
1319	HDFG:	0	1-2 Aug. 1979	(5)
1320	HDFG:	0	14-16 Jan. 1980	(5)
1321	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

1322 HDFG: 0

12 Jan. 1981 (5)

Wahiawa Bridge Reservoir

1323 HDFG: 0

15 Jan. 1976 (2)

1324 HDFG: 0

4-5 Aug. 1976 (2)

1325 HDFG: 0

13 Jan. 1977 (2)

1326 HDFG: 0

27-28 Jul. 1977 (2)

1327 HDFG: 0

12-13 Jan. 1978 (2)

1328 HDFG: 0

15-16, 20 Jan. 1979 (5)

1329 HDFG: 0

1-2 Aug. 1979 (5)

1330 HDFG: 0

14-16 Jan. 1980 (5)

1331 HDFG: 0

31 Jul., 1 Aug. 1980 (5)

Wahiawa Mudflats

1332 HDFG: 0

24 Jul. 1968 (1)

Waikai Reservoir

1333 HDFG: 0

1 Aug. 1975 (2)

1334 HDFG: 0

15 Jan. 1976 (2)

1335 HDFG: 0

4-5 Aug. 1976 (2)

1336 HDFG: 0

13 Jan. 1977 (2)

1337 HDFG: 0

27-28 Jul. 1977 (2)

1338 HDFG: 0

12-13 Jan. 1978 (2)

1339	HDFG:	0	1-2 Aug. 1979	(5)
1340	HDFG:	0	14 Jan. 1981	(5)

Waikoloi Reservoir

1341	HDFG:	0	1 Aug. 1975	(2)
1342	HDFG:	0	15 Jan. 1976	(2)
1343	HDFG:	0	4-5 Aug. 1976	(2)
1344	HDFG:	0	13 Jan. 1977	(2)
1345	HDFG:	0	27-28 Jul. 1977	(2)
1346	HDFG:	0	12-13 Jan. 1978	(2)
1347	HDFG:	0	1-2 Aug. 1979	(5)
1348	HDFG:	0	14 Jan. 1981	(5)

Waimea Taro Fields

1349	HDFG:	4	1 Aug. 1975	(2)
1350	HDFG:	0	15 Jan. 1976	(2)
1351	HDFG:	0	4-5 Aug. 1976	(2)
1352	HDFG:	5	13 Jan. 1977	(2)
1353	HDFG:	0	27-28 Jul. 1977	(2)
1354	HDFG:	0	12-13 Jan. 1978	(2)
1355	HDFG:	0	15-16, 20 Jan. 1979	(5)
1356	HDFG:	2	1-2 Aug. 1979	(5)
1357	HDFG:	0	14-16 Jan. 1980	(5)

Waimea (village)

1358 specimens of eggs, nestlings, a half-grown bird and 4 adults collected; hundreds (of stilts) were in sight on ponds near Mr. Knudsen's house - several acres

4 May (1900)

BRYW15b

1359 Judd collected 1 specimen

(1890's)

(10)

KOLOA

Aepo Reservoir

1360 HDFG: 0

1 Aug. 1975

(2)

1361 HDFG: 0

15 Jan. 1976

(2)

1362 HDFG: 0

4-5 Aug. 1976

(2)

1363 HDFG: 0

13 Jan. 1977

(2)

1364 HDFG: 0

27-28 Jul. 1977

(2)

1365 HDFG: 0

12-13 Jan. 1978

(2)

1366 HDFG: 0

15-16, 20 Jan. 1979

(5)

1367 HDFG: 0

1-2 Aug. 1979

(5)

1368 HDFG: 0

14-16 Jan. 1980

(5)

1369 HDFG: 0

31 Jul., 1 Aug. 1980

(5)

Aepoalua Reservoir

1370 HDFG: 0

1 Aug. 1975

(2)

1371 HDFG: 0

15 Jan. 1976

(2)

1372 HDFG: 0

4-5 Aug. 1976

(2)

1373	HDFG:	0	13 Jan. 1977	(2)
1374	HDFG:	0	27-28 Jul. 1977	(2)
1375	HDFG:	0	15-16, 20 Jan. 1979	(5)
1376	HDFG:	0	1-2 Aug. 1979	(5)
1377	HDFG:	0	14-16 Jan. 1980	(5)
1378	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Aepoeha Reservoir

1379	HDFG:	0	1 Aug. 1975	(2)
1380	HDFG:	0	15 Jan. 1976	(2)
1381	HDFG:	0	4-5 Aug. 1976	(2)
1382	HDFG:	0	13 Jan. 1977	(2)
1383	HDFG:	0	27-28 Jul. 1977	(2)
1384	HDFG:	0	12-13 Jan. 1978	(2)
1385	HDFG:	0	27-28, 30 Jul. 1978	(5)
1386	HDFG:	0	15-16, 20 Jan. 1979	(5)
1387	HDFG:	0	1-2 Aug. 1979	(5)
1388	HDFG:	0	14-16 Jan. 1980	(5)

Apeokolu Reservoir

1389	HDFG:	0	1 Aug. 1975	(2)
1390	HDFG:	0	15 Jan. 1976	(2)

1391	HDFG:	0	4-5 Aug. 1976	(2)
1392	HDFG:	0	13 Jan. 1977	(2)
1393	HDFG:	0	27-28 Jul. 1977	(2)
1394	HDFG:	0	12-13 Jan. 1978	(2)
1395	HDFG:	0	27-28, 30 Jul. 1978	(5)
1396	HDFG:	0	15-16, 20 Jan. 1979	(5)
1397	HDFG:	0	1-2 Aug. 1979	(5)
1398	HDFG:	0	14-16 Jan. 1980	(5)

Grove Farm Settling Basin

1399	HDFG:	0	12 Apr. 1972	(1)
1400	HDFG:	0	summer survey 1974	(8)
1401	HDFG:	4	8 Nov. 1974	(8)
1402	HDFG:	0	winter survey 1974-75	(8)
1403	HDFG:	0	spring survey 1975	(8)
1404	HDFG:	16	1 Aug. 1975	(2)
1405	HDFG:	0	15 Jan. 1976	(2)
1406	HDFG:	0	4-5 Aug. 1976	(2)
1407	HDFG:	6	13 Jan. 1977	(2)
1408	HDFG:	51	27-28 Jul. 1977	(2)
1409	HDFG:	1	12-13 Jan. 1978	(2)
1410	HDFG:	78	27-28, 30 Jul. 1978	(5)

1411	HDFG:	0	15-16, 20 Jan. 1979	(5)
1412	HDFG:	7	1-2 Aug. 1979	(5)
1413	HDFG:	4	14-16 Jan. 1980	(5)
1414	HDFG:	0	12 Jan. 1981	(5)

Grove Farm Trash Pile

1415	Banko:	use mud flats...in small numbers,	(1964-66)	(17)
1416	HDFG:	0	3 Aug. 1972	(8)
1417	HDFG:	0	11 Nov. 1972	(8)
1418	HDFG:	0	18 Jan. 1973	(8)
1419	HDFG:	5	17 Apr. 1973	(8)
1420	HDFG:	3	9 Aug. 1973	(8)
1421	HDFG:	3	15 Nov. 1973	(8)
1422	HDFG:	0	15 Jan. 1974	(8)
1423	HDFG:	0	10 Apr. 1974	(8)
1424	HDFG:	0	summer survey 1974	(8)
1425	HDFG:	0	fall survey 1974	(8)
1426	HDFG:	0	winter survey 1974-75	(8)
1427	HDFG:	0	spring survey 1975	(8)
1428	HDFG:	0	1 Aug. 1975	(2)
1429	HDFG:	0	15 Jan. 1976	(2)

1430	HDFG:	0	4-5 Aug. 1976	(2)
1431	HDFG:	0	13 Jan. 1977	(2)
1432	HDFG:	0	27-28 Jul. 1977	(2)
1433	HDFG:	0	12-13 Jan. 1978	(2)
1434	HDFG:	0	15-16, 20 Jan. 1979	(5)
1435	HDFG:	0	1-2 Aug. 1979	(5)
1436	HDFG:	0	14-16 Jan. 1980	(5)

Halenanahu Reservoir

1437	HDFG:	0	summer survey 1974	(8)
1438	HDFG:	0	fall survey 1974	(8)
1439	HDFG:	0	winter survey 1974-75	(8)
1440	HDFG:	0	spring survey 1975	(8)
1441	HDFG:	2	1 Aug. 1975	(2)
1442	HDFG:	0	15 Jan. 1976	(2)
1443	HDFG:	0	4-5 Aug. 1976	(2)
1444	HDFG:	0	13 Jan. 1977	(2)
1445	HDFG:	0	27-28 Jul. 1977	(2)
1446	HDFG:	0	12-13 Jan. 1978	(2)
1447	HDFG:	0	15-16, 20 Jan. 1979	(5)
1448	HDFG:	5	1-2 Aug. 1979	(5)
1449	HDFG:	0	14-16 Jan. 1980	(5)

Hanini Reservoir

1450	HDFG:	0	1 Aug. 1975	(2)
1451	HDFG:	0	15 Jan. 1976	(2)
1452	HDFG:	0	4-5 Aug. 1976	(2)
1453	HDFG:	0	13 Jan. 1977	(2)
1454	HDFG:	0	27-28 Jul. 1977	(2)
1455	HDFG:	0	12-13 Jan. 1978	(2)
1456	HDFG:	0	27-28, 30 Jul. 1978	(5)
1457	HDFG:	0	15-16, 20 Jan. 1979	(5)
1458	HDFG:	0	1-2 Aug. 1979	(5)
1459	HDFG:	0	14-16 Jan. 1980	(5)

Huinawai Reservoir

1460	HDFG:	0	1 Aug. 1975	(2)
1461	HDFG:	0	15 Jan. 1976	(2)
1462	HDFG:	0	4-5 Aug. 1976	(2)
1463	HDFG:	0	13 Jan. 1977	(2)
1464	HDFG:	0	27-28 Jul. 1977	(2)
1465	HDFG:	0	12-13 Jan. 1978	(2)
1466	HDFG:	0	15-16, 20 Jan. 1979	(5)
1467	HDFG:	0	1-2 Aug. 1979	(5)

1468	HDFG:	0	14-16 Jan. 1980	(5)
1469	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Kaupale Reservoir

1470	HDFG:	0	1 Aug. 1975	(2)
1471	HDFG:	0	15 Jan. 1976	(2)
1472	HDFG:	0	4-5 Aug. 1976	(2)
1473	HDFG:	0	13 Jan. 1977	(2)
1474	HDFG:	0	27-28 Jul. 1977	(2)
1475	HDFG:	0	12-13 Jan. 1978	(2)
1476	HDFG:	0	27-28, 30 Jul. 1978	(5)
1477	HDFG:	0	15-16, 20 Jan. 1979	(5)
1478	HDFG:	0	1-2 Aug. 1979	(5)
1479	HDFG:	0	14-16 Jan. 1980	(5)
1480	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Kipu Reservoir #1

1481	HDFG:	0	summer survey 1974	(8)
1482	HDFG:	0	fall survey 1974	(8)
1483	HDFG:	0	winter survey 1974-75	(8)
1484	HDFG:	0	spring survey 1975	(8)
1485	HDFG:	0	1 Aug. 1975	(2)
1486	HDFG:	0	15 Jan. 1976	(2)

1487	HDFG:	0	4-5 Aug. 1976	(2)
1488	HDFG:	0	13 Jan. 1977	(2)
1489	Shallenberger:	0	18 May 1977	(3)
1490	Shallenberger:	0	20 Jul. 1977	(3)
1491	HDFG:	0	27-28 Jul. 1977	(2)
1492	HDFG:	0	12-13 Jan. 1978	(2)
1493	HDFG:	0	15-16, 20 Jan. 1979	(5)
1494	HDFG:	0	1-2 Aug. 1979	(5)
1495	HDFG:	0	14-16 Jan. 1980	(5)
1496	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
Kipu Reservoir #2				
1497	HDFG:	0	summer survey 1974	(8)
1498	HDFG:	0	fall survey 1974	(8)
1499	HDFG:	0	winter survey 1974-75	(8)
1500	HDFG:	0	spring survey 1975	(8)
1501	HDFG:	0	1 Aug. 1975	(2)
1502	HDFG:	0	15 Jan. 1976	(2)
1503	HDFG:	34	4-5 Aug. 1976	(2)
1504	HDFG:	0	13 Jan. 1977	(2)
1505	Shallenberger:	0	18 May 1977	(3)

1506 Shallenberger: 0

1507 HDFG: 0

1508 HDFG: 0

1509 HDFG: 0

1510 HDFG: 0

1511 HDFG: 0

1512 HDFG: 0

Kipu Reservoir #3

1513 HDFG: 0

1514 HDFG: 0

1515 HDFG: 0

1516 HDFG: 0

1517 HDFG: 0

1518 HDFG: 0

1519 HDFG: 0

1520 HDFG: 0

1521 Shallenberger: 0

1522 Shallenberger: 0

1523 HDFG: 0

1524 HDFG: 0

1525 HDFG: 0

20 Jul. 1977 (3)

27-28 Jul. 1977 (2)

12-13 Jan. 1978 (2)

15-16, 20 Jan. 1979 (5)

1-2 Aug. 1979 (5)

14-16 Jan. 1980 (5)

31 Jul., 1 Aug. 1980 (5)

summer survey 1974 (8)

fall survey 1974 (8)

winter survey 1974-75 (8)

spring survey 1975 (8)

1 Aug. 1975 (2)

15 Jan. 1976 (2)

4-5 Aug. 1976 (2)

13 Jan. 1977 (2)

18 May 1977 (3)

20 Jul. 1977 (3)

27-28 Jul. 1977 (2)

12-13 Jan. 1978 (2)

15-16, 20 Jan. 1979 (5)

1526	HDFG:	0	1-2 Aug. 1979	(5)
1527	HDFG:	0	14-16 Jan. 1980	(5)
1528	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Kipu Road Reservoir

1529				
1530	HDFG:	0	1 Aug. 1975	(2)
1531	HDFG:	0	15 Jan. 1976	(2)
1532	HDFG:	0	4-5 Aug. 1976	(2)
1533	HDFG:	0	13 Jan. 1977	(2)
1534	HDFG:	0	27-28 Jul. 1977	(2)
1535	HDFG:	0	12-13 Jan. 1978	(2)
1536	HDFG:	0	15-16, 20 Jan. 1979	(5)
1537	HDFG:	0	1-2 Aug. 1979	(5)
1538	HDFG:	0	14-16 Jan. 1980	(5)
1539	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1540	HDFG:	0	12 Jan. 1981	(5)

Koloakaapohu Reservoir

1541	HDFG:	0	24 Jul. 1969	(0)
1542	HDFG:	0	1 Aug. 1975	(2)
1543	HDFG:	0	15 Jan. 1976	(2)

1544	HDFG:	0	4-5 Aug. 1976	(2)
1545	HDFG:	0	13 Jan. 1977	(2)
1546	HDFG:	0	27-28 Jul. 1977	(2)
1547	HDFG:	0	12-13 Jan. 1978	(2)
1548	HDFG:	0	27-28, 30 Jul. 1978	(5)
1549	HDFG:	0	15-16, 20 Jan. 1979	(5)
1550	HDFG:	0	1-2 Aug. 1979	(5)
1551	HDFG:	0	14-16 Jan. 1980	(5)

Kumano Reservoir

1552	HDFG:	0	1 Aug. 1975	(2)
1553	HDFG:	0	15 Jan. 1976	(2)
1554	HDFG:	0	4-5 Aug. 1976	(2)
1555	HDFG:	0	13 Jan. 1977	(2)
1556	HDFG:	0	27-28 Jul. 1977	(2)
1557	HDFG:	0	12-13 Jan. 1978	(2)
1558	HDFG:	0	27-28, 30 Jul. 1978	(5)
1559	HDFG:	0	15-16, 20 Jan. 1979	(5)
1560	HDFG:	0	1-2 Aug. 1979	(5)
1561	HDFG:	0	14-16 Jan. 1980	(5)
1562	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1563	HDFG:	0	12 Jan. 1981	(5)

Lawai Kai Estuary

1564	HDFG:	0	4-5 Aug. 1976	(2)
1565	HDFG:	0	13 Jan. 1977	(2)
1566	HDFG:	0	27-28 Jul. 1977	(2)
1567	HDFG:	0	12-13 Jan. 1978	(2)
1568	HDFG:	0	1-2 Aug. 1979	(5)
1569	HDFG:	0	14-16 Jan. 1980	(5)
1570	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Loko Reservoir

1571	HDFG:	0	1 Aug. 1975	(2)
1572	HDFG:	0	15 Jan. 1976	(2)
1573	HDFG:	34	4-5 Aug. 1976	(2)
1574	HDFG:	0	13 Jan. 1977	(2)
1575	HDFG:	2	27-28 Jul. 1977	(2)
1576	HDFG:	0	12-13 Jan. 1978	(2)
1577	HDFG:	0	15-16, 20 Jan. 1979	(5)
1578	HDFG:	0	1-2 Aug. 1979	(5)
1579	HDFG:	0	14-16 Jan. 1980	(5)

Luawai Reservoir

1580	HDFG:	0	15 Jan. 1976	(2)
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1581	HDFG:	34	4-5 Aug. 1976	(2)
1582	HDFG:	0	13 Jan. 1977	(2)
1583	HDFG:	2	27-28 Jul. 1977	(2)
1584	HDFG:	0	12-13 Jan. 1978	(2)
1585	HDFG:	3	27-28, 30 Jul. 1978	(5)
1586	HDFG:	0	15-16, 20 Jan. 1979	(5)
1587	HDFG:	0	1-2 Aug. 1979	(5)
1588	HDFG:	0	14-16 Jan. 1980	(5)

Mahalepu Ponds

1589	HDFG:	0	summer survey 1974	(8)
1590	HDFG:	0	fall survey 1974	(8)
1591	HDFG:	0	winter survey 1974-75	(8)
1592	HDFG:	0	spring survey 1975	(8)
1593	HDFG:	0	1 Aug. 1975	(2)
1594	HDFG:	0	15 Jan. 1976	(2)
1595	HDFG:	34	4-5 Aug. 1976	(2)
1596	HDFG:	0	13 Jan. 1977	(2)
1597	HDFG:	0	27-28 Jul. 1977	(2)
1598	HDFG:	0	12-13 Jan. 1978	(2)
1599	HDFG:	0	15-16, 20 Jan. 1979	(5)

1600	HDFG:	0	1-2 Aug. 1979	(5)
1601	HDFG:	0	14-16 Jan. 1980	(5)
1602	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Manuhonuhonu Reservoir

1603	HDFG:	0	1 Aug. 1975	(2)
1604	HDFG:	0	15 Jan. 1976	(2)
1605	HDFG:	0	4-5 Aug. 1976	(2)
1606	HDFG:	0	13 Jan. 1977	(2)
1607	HDFG:	0	27-28 Jul. 1977	(2)
1608	HDFG:	0	12-13 Jan. 1978	(2)
1609	HDFG:	0	15-16, 20 Jan. 1979	(5)
1610	HDFG:	0	1-2 Aug. 1979	(5)
1611	HDFG:	0	14-16 Jan. 1980	(5)
1612	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1613	HDFG:	0	12 Jan. 1981	(5)

Mauka Reservoir

1614	HDFG:	0	24 Jul. 1968	(1)
1615	HDFG:	0	24 Jul. 1969	(1)
1616	HDFG:	0	summer survey 1974	(8)
1617	HDFG:	0	fall survey 1974	(8)

1618	HDFG:	0	winter survey 1974-75	(8)
1619	HDFG:	0	spring survey	(8)
1620	HDFG:	3	1 Aug. 1975	(2)
1621	HDFG:	0	15 Jan. 1976	(2)
1622	HDFG:	0	4-5 Aug. 1976	(2)
1623	HDFG:	2	13 Jan. 1977	(2)
1624	HDFG:	1	20 Jan. 1977	(14)
1625	HDFG:	0	27-28 Jul. 1977	(2)
1626	HDFG:	0	12-13 Jan. 1978	(2)
1627	HDFG:	0	27-28, 30 Jul. 1978	(5)
1628	HDFG:	0	15-16, 20 Jan. 1979	(5)
1629	HDFG:	0	1-2 Aug. 1979	(5)
1630	HDFG:	0	14-16 Jan. 1980	(5)

Omao Reservoir

1631	HDFG:	0	1 Aug. 1975	(2)
1632	HDFG:	0	15 Jan. 1976	(2)
1633	HDFG:	0	4-5 Aug. 1976	(2)
1634	HDFG:	0	13 Jan. 1977	(2)
1635	HDFG:	0	27-28 Jul. 1977	(2)
1636	HDFG:	0	12-13 Jan. 1978	(2)

1637	HDFG:	0	27-28, 30 Jul. 1978	(5)
1638	HDFG:	0	15-16, 20 Jan. 1979	(5)
1639	HDFG:	0	1-2 Aug. 1979	(5)
1640	HDFG:	0	14-16 Jan. 1980	(5)

Papuaa Reservoir

1641	HDFG:	0	summer survey 1974	(8)
1642	HDFG:	0	fall survey 1974	(8)
1643	HDFG:	0	winter survey 1974-75	(8)
1644	HDFG:	0	spring survey	(8)
1645	HDFG:	3	1 Aug. 1975	(2)
1646	HDFG:	0	15 Jan. 1976	(2)
1647	HDFG:	0	4-5 Aug. 1976	(2)
1648	HDFG:	0	27-28 Jul. 1977	(2)
1649	HDFG:	0	12-13 Jan. 1978	(2)
1650	HDFG:	0	27-28, 30 Jul. 1978	(5)
1651	HDFG:	0	15-16, 20 Jan. 1979	(5)
1652	HDFG:	0	1-2 Aug. 1979	(5)
1653	HDFG:	0	14-16 Jan. 1980	(5)

Pia Mill Reservoir

1654	HDFG:	0	1 Aug. 1975	(2)
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1655	HDFG:	0	15 Jan. 1976	(2)
1656	HDFG:	0	4-5 Aug. 1976	(2)
1657	HDFG:	0	13 Jan. 1977	(2)
1658	Shallenberger:	saw a pair fly over	20 Jul. 1977	(3)
1659	HDFG:	0	27-28 Jul. 1977	(2)
1660	HDFG:	0	13 Jan. 1978	(2)
1661	HDFG:	0	27-28, 30 Jul. 1978	(5)
1662	HDFG:	0	15-16, 20 Jan. 1979	(5)
1663	HDFG:	0	1-2 Aug. 1979	(5)
1664	HDFG:	0	14-16 Jan. 1980	(5)

Pinau Reservoir

1665	HDFG:	0	1 Aug. 1975	(2)
1666	HDFG:	0	15 Jan. 1976	(2)
1667	HDFG:	0	4-5 Aug. 1976	(2)
1668	HDFG:	0	13 Jan. 1977	(2)
1669	HDFG:	0	27-28 Jul. 1977	(2)
1670	HDFG:	0	12-13 Jan. 1978	(2)
1671	HDFG:	0	27-28, 30 Jul. 1978	(5)
1672	HDFG:	0	15-16, 20 Jan. 1979	(5)
1673	HDFG:	0	1-2 Aug. 1979	(5)

1674	HDFG: 0	14-16 Jan. 1980	(5)
1675	HDFG: 0	31 Jul., 1 Aug. 1980	(5)
1676	HDFG: 0	12 Jan. 1981	(5)

Piwai Reservoir

1677	HDFG: 0	1 Aug. 1975	(2)
1678	HDFG: 0	15 Jan. 1976	(2)
1679	HDFG: 0	4-5 Aug. 1976	(2)
1680	HDFG: 0	27-28 Jul. 1977	(2)
1681	HDFG: 0	12-13 Jan. 1978	(2)
1682	HDFG: 0	15-16, 20 Jan. 1979	(5)
1683	HDFG: 0	14-16 Jan. 1980	(5)
1684	HDFG: 0	12 Jan. 1981	(5)

Poipu Ponds

1685	Banko: up to 6 use area regularly, up to 40 occasionally (result of 95 surveys by HDFG)	(1963-66)	(17)
1686	HDFG: 0	24 Jul. 1968	(1)
1687	HDFG: 0	1 Aug. 1975	(2)
1688	HDFG: 0	15 Jan. 1976	(2)
1689	HDFG: 0	4-5 Aug. 1976	(2)
1690	HDFG: 0	13 Jan. 1977	(2)
1691	HDFG: 0	27-28 Jul. 1977	(2)

1692	HDFG:	0	12-13 Jan. 1978	(2)
1693	HDFG:	0	15-16, 20 Jan. 1979	(5)
1694	HDFG:	0	1-2 Aug. 1979	(5)
1695	HDFG:	0	14-16 Jan. 1980	(5)
1696	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1697	HDFG:	0	12 Jan. 1981	(5)

Puuhi Reservoir

1698	HDFG:	0	summer survey 1974	(8)
1699	HDFG:	0	fall survey 1974	(8)
1700	HDFG:	0	winter survey 1974-75	(8)
1701	HDFG:	0	spring survey	(8)
1702	HDFG:	0	1 Aug. 1975	(2)
1703	HDFG:	0	15 Jan. 1976	(2)
1704	HDFG:	3	4-5 Aug. 1976	(2)
1705	HDFG:	0	13 Jan. 1977	(2)
1706	HDFG:	0	27-28 Jul. 1977	(2)
1707	HDFG:	4	12-13 Jan. 1978	(2)
1708	HDFG:	0	15-16, 20 Jan. 1979	(5)
1709	HDFG:	4	1-2 Aug. 1979	(5)
1710	HDFG:	3	14-16 Jan. 1980	(5)

Puu O Hewa Reservoir

1711	HDFG:	1	1 Aug. 1975	(2)
1712	HDFG:	0	15 Jan. 1976	(2)
1713	HDFG:	2	4-5 Aug. 1976	(2)
1714	HDFG:	0	13 Jan. 1977	(2)
1715	HDFG:	2	27-28 Jul. 1977	(2)
1716	HDFG:	0	12-13 Jan. 1978	(2)
1717	HDFG:	0	27-28, 30 Jul. 1978	(5)
1718	HDFG:	0	15-16, 20 Jan. 1979	(5)
1719	HDFG:	0	1-2 Aug. 1979	(5)
1720	HDFG:	0	14-16 Jan. 1980	(5)
1721	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Waita Reservoir

1722	Banko:	up to 24, usually during winter, most years (HDFG)	1966	(11)
1723	HDFG:	12	24 Jul. 1968	(1)
1724	HDFG:	9	24 Jul. 1969	(1)
1725	HDFG:	15	7 Jan. 1970	(1)
1726	USFWS:	6	14 Sep. 1970	(12)
1727	HDFG:	0	30 Nov. 1970	(8)

1728	HDFG:	0	12 Jan. 1971	(8)
1729	HDFG:	0	22 Apr. 1971	(8)
1730	HDFG:	15	7 Aug. 1971	(8)
1731	HDFG:	0	12 Apr. 1972	(1)
1732	HDFG:	7	3 Aug. 1972	(8)
1733	HDFG:	0	11 Nov. 1972	(8)
1734	HDFG:	11	18 Jan. 1973	(8)
1735	HDFG:	0	17 Apr. 1973	(8)
1736	HDFG:	7	9 Aug. 1973	(8)
1737	HDFG:	0	15 Nov. 1973	(8)
1738	HDFG:	0	15 Jan. 1974	(8)
1739	HDFG:	0	10 Apr. 1974	(8)
1740	HDFG:	8	2 Aug. 1974	(8)
1741	HDFG:	0	fall survey 1974	(8)
1742	HDFG:	0	winter survey 1974-75	(8)
1743	HDFG:	0	spring survey	(8)
1744	HDFG:	17	1 Aug. 1975	(2)
1745	HDFG:	0	15 Jan. 1976	(2)
1746	HDFG:	6	4-5 Aug. 1976	(2)
1747	HDFG:	13	13 Oct. 1976	(14)

1748	HDFG: 23	13 Jan. 1977	(2)
1749	Shallenberger: total of 2 seen on 2 surveys	16,18 May; 20 Jul. 1977	(3)
1750	HDFG: 0	27-28 Jul. 1977	(2)
1751	HDFG: 6	12-13 Jan. 1978	(2)
1752	HDFG: 0	27-28, 30 Jul. 1978	(5)
1753	HDFG: 0	15-16, 20 Jan. 1979	(5)
1754	HDFG: 19	1-2 Aug. 1979	(5)
1755	HDFG: 0	14-16 Jan. 1980	(5)
1756	HDFG: 0	31 Jul. 1980	(5)

LIHUE

Ahukini Reservoir

1757	Banko: up to 12 seen, irregular periods during draw down (HDFG)	(1966)	(17)
1758	HDFG: 0	24 Jul. 1968	(1)
1759	USFWS: 0	14 Oct. 1968	(12)
1760	HDFG: 0	24 Jul. 1969	(1)
1761	USFWS: 2	14 Sep. 1970	(12)
1762	HDFG: 19	30 Nov. 1970	(8)
1763	HDFG: 0	12 Jan. 1971	(8)
1764	HDFG: 0	22 Apr. 1971	(8)
1765	HDFG: 10	27 Jul. 1971	(8)

1766	HDFG:	0	7 Aug. 1971	(8)
1767	HDFG:	0	9 Nov. 1971	(8)
1768	HDFG:	0	29 Feb. 1972	(8)
1769	HDFG:	0	12 Apr. 1972	(1)
1770	HDFG:	8	3 Aug. 1972	(8)
1771	HDFG:	60	11 Nov. 1972	(8)
1772	HDFG:	0	18 Jan. 1973	(8)
1773	HDFG:	11	17 Apr. 1973	(8)
1774	HDFG:	31	9 Aug. 1973	(8)
1775	HDFG:	8	15 Nov. 1973	(8)
1776	HDFG:	0	15 Jan. 1974	(8)
1777	HDFG:	0	10 Apr. 1974	(8)
1778	HDFG:	2	2 Aug. 1974	(1)
1779	HDFG:	1	22-23 Jan. 1975	(8)
1780	HDFG:	0	spring survey	(8)
1781	HDFG:	17	1 Aug. 1975	(2)
1782	HDFG:	0	fall survey 1975	(8)
1783	HDFG:	0	15 Jan. 1976	(2)
1784	HDFG:	3	4-5 Aug. 1976	(2)
1785	HDFG:	0	13 Jan. 1977	(2)

1786	HDFG:	11	29 Mar. 1977	(14)
1787	HDFG:	2	21 Apr. 1977	(14)
1788	HDFG:	2	28 Jun. 1977	(14)
1789	HDFG:	0	27-28 Jul. 1977	(2)
1790	HDFG:	0	12-13 Jan. 1978	(2)
1791	HDFG:	0	27-28, 30 Jul. 1978	(5)
1792	HDFG:	2	15-16, 20 Jan. 1979	(5)
1793	HDFG:	26	1-2 Aug. 1979	(5)
1794	HDFG:	0	14-16 Jan. 1980	(5)

Aweoweonui Valley

1795	HDFG:	1	8-10 Jan. 1968	(1)
1796	HDFG:	1	13-14 Jan. 1969	(1)
1797	HDFG:	3	13-15 Jan. 1970	(1)
1798	HDFG:	5	30 Nov. 1970	(8)
1799	HDFG:	0	12 Jan. 1971	(8)
1800	HDFG:	0	22 Apr. 1971	(8)
1801	HDFG:	0	27 Jul. 1971	(8)
1802	HDFG:	0	7 Aug. 1971	(8)
1803	HDFG:	0	9 Nov. 1971	(8)
1804	HDFG:	2	29 Feb. 1972	(8)

1805	HDFG:	1	12 Apr. 1972	(1)
1806	HDFG:	0	summer survey 1974	(8)
1807	HDFG:	0	fall survey 1974	(8)
1808	HDFG:	0	winter survey 1974-75	(8)
1809	HDFG:	0	spring survey	(8)
1810	HDFG:	0	1 Aug. 1975	(2)
1811	HDFG:	2	15 Jan. 1976	(2)
1812	HDFG:	0	4-5 Aug. 1976	(2)
1813	HDFG:	0	13 Jan. 1977	(2)
1814	HDFG:	0	27-28 Jul. 1977	(2)
1815	HDFG:	0	12-13 Jan. 1978	(2)
1816	HDFG:	0	1-2 Aug. 1979	(5)
1817	HDFG:	0	14-16 Jan. 1980	(5)

Halehaka Reservoir

1818	HDFG:	0	1 Aug. 1975	(2)
1819	HDFG:	0	15 Jan. 1976	(2)
1820	HDFG:	0	4-5 Aug. 1976	(2)
1821	HDFG:	0	13 Jan. 1977	(2)
1822	HDFG:	0	27-28 Jul. 1977	(2)
1823	HDFG:	0	12-13 Jan. 1978	(2)

1824	HDFG:	0	15-16, 20 Jan. 1979	(5)
1825	HDFG:	0	1-2 Aug. 1979	(5)
1826	HDFG:	0	14-16 Jan. 1980	(5)
1827	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
1828	HDFG:	0	12 Jan. 1981	(5)

Huleia National Wildlife Refuge

1829	HDFG:	0	summer survey 1974	(8)
1830	HDFG:	0	fall survey 1974	(8)
1831	HDFG:	0	winter survey 1974-75	(8)
1832	HDFG:	0	spring survey	(8)
1833	HDFG:	0	1 Aug. 1975	(2)
1834	HDFG:	0	15 Jan. 1976	(2)
1835	HDFG:	0	4-5 Aug. 1976	(2)
1836	Shallenberger:	6	Oct. 1976	(3)
1837	HDFG:	0	13 Jan. 1977	(2)
1838	HDFG:	0	27-28 Jul. 1977	(2)
1839	HDFG:	0	12-13 Jan. 1978	(2)
1840	HDFG:	0	15-16, 20 Jan. 1979	(5)
1841	HDFG:	0	1-2 Aug. 1979	(5)
1842	HDFG:	0	14-16 Jan. 1980	(5)

1843	USFWS:	0, ave. daily use	16 Dec '81-15 Jan '82	(13)
1844	USFWS:	0, ave. daily use	15 Feb-31 Mar '82	(13)
1845	USFWS:	0, ave. daily use	April 1982	(13)
1846	USFWS:	0, ave. daily use	May 1982	(13)
1847	USFWS:	0, ave. daily use	June 1982	(13)

Huleia Valley (Huleia NWR & Menehune Fishpond)

1848	Shallenberger:	recorded irregularly in small numbers at the fishpond and in flooded pastures upstream	(1977)	(3)
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Kauai Surf Golf Course Ponds

1849	HDFG:	0	1 Aug. 1975	(2)
1850	HDFG:	0	15 Jan. 1976	(2)
1851	HDFG:	0	4-5 Aug. 1976	(2)
1852	HDFG:	0	13 Jan. 1977	(2)
1853	HDFG:	0	27-28 Jul. 1977	(2)
1854	HDFG:	0	12-13 Jan. 1978	(2)
1855	HDFG:	0	15-16, 20 Jan. 1979	(5)
1856	HDFG:	0	1-2 Aug. 1979	(5)
1857	HDFG:	0	14-16 Jan. 1980	(5)
1858	HDFG:	0	12 Jan. 1981	(5)

Kauai Surf Hotel Ponds

1859	HDFG:	0	1 Aug. 1975	(2)
1860	HDFG:	0	15 Jan. 1976	(2)
1861	HDFG:	0	4-5 Aug. 1976	(2)
1862	HDFG:	0	13 Jan. 1977	(2)
1863	HDFG:	0	27-28 Jul. 1977	(2)
1864	HDFG:	0	12-13 Jan. 1978	(2)
1865	HDFG:	0	15-16, 20 Jan. 1979	(5)
1866	HDFG:	0	1-2 Aug. 1979	(5)
1867	HDFG:	0	14-16 Jan. 1980	(5)

Kipu Reservoir #4

1868	HDFG:	0	summer survey 1974	(8)
1869	HDFG:	0	fall survey 1974	(8)
1870	HDFG:	0	winter survey 1974-75	(8)
1871	HDFG:	0	spring survey	(8)
1872	HDFG:	3	1 Aug. 1975	(2)
1873	HDFG:	4	15 Jan. 1976	(2)
1874	HDFG:	2	4-5 Aug. 1976	(2)
1875	HDFG:	3	13 Jan. 1977	(2)
1876	Shallenberger:	0	18 May 1977	(3)

1877	Shallenberger:	0	20 Jul. 1977	(3)
1878	HDFG:	0	27-28 Jul. 1977	(2)
1879	HDFG:	0	12-13 Jan. 1978	(2)
1880	HDFG:	3	27-28, 30 Jul. 1978	(2)
1881	HDFG:	4	15-16, 20 Jan. 1979	(5)
1882	HDFG:	0	1-2 Aug. 1979	(5)
1883	HDFG:	2	14-16 Jan. 1980	(5)
1884	HDFG:	0	31 Jul., 1 Aug. 1980	(5)

Lihue Cane Trash Pile

1885	HDFG:	0	summer survey 1974	(8)
1886	HDFG:	0	fall survey 1974	(8)
1887	HDFG;	4	22-23 Jan. 1975	(8)
1888	HDFG:	0	spring survey 1975	(8)

Lihue Plantation Settling Basin

1889	Banko:	up to 6...irregualrly, year around (HDFG)	(1966)	(17)
1890	1	seen	25 Jan. 1967	SWEG67
1891	several		5 Nov. (1967)	DONW68b
1892	about	30	4 Jan. 1968	ORER68
1893	HDFG:	4	8-10 Jan. 1968	(1)
1894	HDFG:	34	24 Jul. 1968	(1)

1895	HDFG:	14	13-14 Jan. 1969	(1)
1896	HDFG:	2	24 Jul. 1969	(1)
1897	HDFG:	3	13-15 Jan. 1970	(1)
1898	HDFG:	17	7 Aug. 1970	(1)
1899	USFWS:	5	14 Sep. 1970	(12)
1900	HDFG:	14	30 Nov. 1970	(8)
1901	HDFG:	14	12 Jan. 1971	(8)
1902	HDFG:	1	22 Apr. 1971	(8)
1903	HDFG:	26	27 Jul. 1971	(8)
1904	HDFG:	17	7 Aug. 1971	(8)
1905	HDFG:	44	9 Nov. 1971	(8)
1906	HDFG:	7	29 Feb. 1972	(8)
1907	HDFG:	22	12 Apr. 1972	(1)
1908	HDFG:	56	3 Aug. 1972	(8)
1909	HDFG:	0	11 Nov. 1972	(8)
1910	HDFG:	7	18 Jan. 1973	(8)
1911	HDFG:	42	17 Apr. 1973	(8)
1912	HDFG:	2	8 Aug. 1973	(1)
1913	HDFG:	0	9 Aug. 1973	(8)
1914	HDFG:	25	15 Nov. 1973	(8)

1915	HDFG:	0	15 Jan. 1974	(8)
1916	HDFG:	1	10 Apr. 1974	(8)
1917	HDFG:	adult with 5 chicks seen	20 Jun. 1974	(8)
1918	HDFG:	62	2 Aug. 1974	(2)
1919	HDFG:	17	8 Nov. 1974	(2)
1920	HDFG:	7	22-23 Jan. 1975	(2)
1921	HDFG:	0	spring survey	(2)
1922	HDFG:	40	1 Aug. 1975	(2)
1923	HDFG:	2	15 Jan. 1976	(2)
1924	HDFG:	nest found	24 Jun. 1976	(19)
1925	HDFG:	32	4-5 Aug. 1976	(2)
1926	HDFG:	26	20 Sep. 1976	(14)
1927	HDFG:	37	13 Jan. 1977	(2)
1928	HDFG:	22	3 Feb. 1977	(14)
1929	HDFG:	10	29 Mar. 1977	(14)
1930	HDFG:	5	2 Apr. 1977	(14)
1931	HDFG:	37	28 Jun. 1977	(14)
1932	HDFG:	5	27-28 Jul. 1977	(2)
1933	HDFG:	5 nests found	28 Jun. 1977	(16)
1934	HDFG:	3	12-13 Jan. 1978	(2)

1935	HDFG:	19	27-28, 30 Jul. 1978	(5)
1936	HDFG:	0	15-16, 20 Jan. 1979	(5)
1937	HDFG:	18	1-2 Aug. 1979	(5)
1938	HDFG:	6	14-16 Jan. 1980	(5)

Menehune Fish Pond (now in Huleia National Wildlife Refuge)

1939	HDFG:	0	24 Jul. 1969	(1)
1940	HDFG:	0	summer survey 1974	(8)
1941	HDFG:	0	fall survey 1974	(8)
1942	o seen		29 Dec. 1974	WILE75e
1943	HDFG:	0	winter survey 1974-75	(8)
1944	HDFG:	0	spring survey	(8)
1945	HDFG:	0	1 Aug. 1975	(2)
1946	HDFG:	0	15 Jan. 1976	(2)
1947	HDFG:	0	4-5 Aug. 1976	(2)
1948	HDFG:	0	13 Jan. 1977	(2)
1949	HDFG:	0	27-28 Jul. 1977	(2)
1950	HDFG:	0	12-13 Jan. 1978	(2)
1951	HDFG:	0	15-16, 20 Jan. 1979	(5)
1952	HDFG:	0	1-2 Aug. 1979	(5)
1953	HDFG:	0	14-16 Jan. 1980	(5)

1954	HDFG: 0	31 Jul., 1 Aug. 1980	(5)
Niumalu Flats			
1955	HDFG: 0	12-13 Jan. 1978	(2)
1956	HDFG: 0	31 Jul., 1 Aug. 1980	(5)
Waikaia Reservoir			
1957	HDFG: 0	1 Aug. 1975	(2)
1958	HDFG: 0	15 Jan. 1976	(2)
1959	HDFG: 0	4-5 Aug. 1976	(2)
1960	HDFG: 0	13 Jan. 1977	(2)
1961	HDFG: 0	27-28 Jul. 1977	(2)
1962	HDFG: 0	12-13 Jan. 1978	(2)
1963	HDFG: 1	1-2 Aug. 1979	(5)
1964	HDFG: 0	1 Aug. 1980	(5)

Island of Ni'ihau

ISLANDWIDE INFERENCE

1965	judge several hundred present from counts made on 8 or 9 lagoons	2 Nov. 1939	MUNG40
1966	HDFG: estimated 50-70 at annual stilt count	24 Jul. 1968	(1)
1967	HDFG: 155	24 Jul. 1969	(1)
1968	HDFG: 128	7 Aug. 1970	(1)

1969	HDFG: most migrated to Niihau during the winter months when habitat conditions became favorable there	1970-1971	(8)
1970	HDFG: 42	27 Jul. 1971	(1)
1971	HDFG: 360	12 Apr. 1972	(1)
1972	HDFG: 101	3 Aug. 1972	(8)
1973	HDFG: Extremely dry conditions probably caused stilt to remain on Kauai...State-wide censuses do not consistently cover Niihau during both the winter and summer censuses...Niihau...can usually be censused only once a year due to high cost of aerial survey	1 Jul. 1972 - 30 June 1973	(8)
1974	HDFG: no census...apparently the shallow lakes are quite dry	Aug. 1973	(1)
1975	HDFG: no count this year...commercial helicopter for cross-channel flight unavailable	1 Jul. 1973 - 30 June 1974	(2)
1976	HDFG: migration between Niihau and Kauai correlates closely with seasonal rainfall...heavy winter storms apparently influence stilt to migrate to Niihau...drying up of temporary ponds on Niihau force their return to Kauai...early departures for Niihau this year coincided with earlier than usual fall rains beginning in October and continuing through November, December and January...appears that stilts prefer Niihau habitat to that on Kauai since they will stay there as long as there is sufficient water in the ponds ...only when the ponds dry up do stilt return to Kauai in large numbers / (islandwide)	1 Jul. 1973 -	(8)
1977	HDFG: 51 censused by cooperator	7 Aug. 1974	(8)
1978	HDFG: 135 censused by cooperator	23 Jan. 1975	(8)
1979	HDFG: 37	1 Aug. 1975	(2)

1980	HDFG: 174	15 Jan. 1976	(2)
1981	HDFG: The normal migration from Kauai was delayed this year, possibly because of the late advent of winter kona storms which are believed to stimulate movement	1 Jul. 1975 - 30 June 1976	(2)
1982	HDFG: 25	4-5 Aug. 1976	(2)
1983	HDFG: 44	13 Jan. 1977	(2)
1984	HDFG: water levels were extremely low during both summer and winter censuses...birds were concentrated at only a handful of habitats	1 Jul. 1976 - 30 June 1977	(2)
1985	HDFG: 31	27-28 Jul. 1977	(2)
1986	Shallenberger: most biologists believe that the majority of stilts (on Kauai) breed in wetlands on Niihau	(1977)	(3)
1987	HDFG: 139	12-13 Jan. 1978	(2)
1988	HDFG: Light winter rains...not enough to support normal population	1 Jul. 1977 - 30 June 1978	(2)
1989	HDFG: 113	15,16, 20 Jan. 1979	(5)
1990	HDFG: 14	1,2 Aug. 1979	(5)
1991	HDFG: 34	31 Jul., 1 Aug. 1980	(5)
1992	HDFG: 203	12-14 Jan. 1981	(5)
UNDESIGNATED LOCALITY			
1993	a number were found on the flat lagoons	Jul. 1893	ROTW00
1994	Banko: Palmer obtained 6 specimens	Jul/Aug. 1893	(10)
1995	Banko: Knudsen collected 2 specimens	(1880's-1890's?)	(10)

1996 in great numbers...between 300 and 400 on each of
two ponds (lakes?)

(1964?)

ROBA64

QUADRANGLE/LOCALITY

Haao Reservoir

1997 HDFG: 5

4-5 Aug. 1976

(2)

1998 HDFG: 8

13 Jan. 1977

(2)

Halalii Lake and Ditches

1999 9 found

12-16 Aug. 1947

FISH51

2000 HDFG: 0

12 Apr. 1972

(1)

2001 HDFG: 11

4-5 Aug. 1976

(2)

2002 HDFG: 4

13 Jan. 1977

(2)

2003 HDFG: 0

27-28 Jul. 1977

(2)

2004 HDFG: 3

12-13 Jan. 1978

(2)

2005 HDFG: 2

27,28,30 Jul. 1978

(5)

2006 HDFG: 27

15,16, 20 Jan. 1979

(5)

2007 HDFG: 0

1,2 Aug. 1979

(5)

2008 HDFG: 6

14-16 Jan. 1980

(5)

Halulu Lake and Ditches

2009 HDFG: 55

12 Apr. 1972

(1)

2010 HDFG: 6

4-5 Aug. 1976

(2)

2011	HDFG:	12	13 Jan. 1977	(2)
2012	HDFG:	2	27-28 Jul. 1977	(2)
2013	HDFG:	96	12-13 Jan. 1978	(2)
2014	HDFG:	0	27,28,30 Jul. 1978	(5)
2015	HDFG:	56	15,16, 20 Jan. 1979	(5)
2016	HDFG:	0	1,2 Aug. 1979	(5)
2017	HDFG:	41	14-16 Jan. 1980	(5)
Kaalialinui Valley				
2018	HDFG:	0	1,2 Aug. 1979	(5)
Kaumuhonu Reservoir				
2019	HDFG:	4	14-16 Jan. 1980	(5)
Kaununuui Reservoir				
2020	HDFG:	32	12 Apr. 1972	(1)
Keanauhi Reservoir				
2021	HDFG:	8	12 Apr. 1972	(1)
2022	HDFG:	2	27-28 Jul. 1977	(2)
2023	HDFG:	8	12-13 Jan. 1978	(2)
2024	HDFG:	1	15,16,20 Jan. 1979	(5)
2025	HDFG:	6	14-16 Jan. 1980	(5)

Kiekie Pond(s)

2026	4 found	12-16 Aug. 1947	FISH51
2027	HDFG: 17	13 Jan. 1977	(2)
2028	HDFG: 14	27-28 Jul. 1977	(2)
2029	HDFG: 21	27,28,30 Jul. 1978	(5)
2030	HDFG: 56	15,16, 20 Jan. 1979	(5)
2031	HDFG: 13	14-16 Jan. 1980	(5)

Nonopapa Lake

2032	HDFG: 2	12 Apr. 1972	(1)
2033	HDFG: 3	13 Jan. 1977	(2)
2034	HDFG: 7	27-28 Jul. 1977	(2)
2035	HDFG: 14	12-13 Jan. 1978	(2)
2036	HDFG: 11	27,28,30 Jul. 1978	(5)
2037	HDFG: 23	15,16, 20 Jan. 1979	(5)
2038	HDFG: 4	1,2 Aug. 1979	(5)
2039	HDFG: 39	14-16 Jan. 1980	(5)

Palikoe Pond

2040	HDFG: 0	12-13 Jan. 1978	(2)
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Pohueloa Reservoir

2041	HDFG: 10	12 Apr. 1972	(1)
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2042	HDFG:	6	27-28 Jul. 1977	(2)
2043	HDFG:	6	12-13 Jan. 1978	(2)
2044	HDFG:	9	1,2 Aug. 1979	(5)
2045	HDFG:	0	1 Aug. 1980	(5)

Puu Alala Pond(s)

2046	HDFG:	65	12 Apr. 1972	(1)
2047	HDFG:	4	12-13 Jan. 1978	(2)
2048	HDFG:	6	15,16,20 Jan. 1979	(5)
2049	HDFG:	4	14-16 Jan. 1980	(5)
2050	HDFG:	0	1 Aug. 1980	(5)

Puuwai Pond(s)

2051	49 found	12-16 Aug. 1947	FISH51
2052	HDFG: 188	12 Apr. 1972	(1)
2053	HDFG: 7	12-13 Jan. 1978	(2)
2054	HDFG: 1	27,28,30 Jul. 1978	(5)
2055	HDFG: 0	15,16,20 Jan. 1979	(5)
2056	HDFG: 1	1,2 Aug. 1979	(5)

Island of O'ahu

ISLANDWIDE INFERENCE

2057	HDFG: 163, annual waterfowl count	4-10 Jan. 1956	(1)
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2058	HDFG: 272, annual waterfowl count	1-31 Jan. 1957	(1)
2059	HDFG: 549, annual waterfowl count	14-17 Jan. 1958	(1)
2060	HDFG: 533, annual waterfowl count	7-16 Jan. 1959	(1)
2061	HDFG: no census	Jan. 1960	(1)
2062	HDFG: 134, annual waterfowl count	10-13 Jan. 1961	(1)
2063	550 at least	prior Sep. 1961	ORDW62b
2064	HDFG: 175, annual waterfowl count	15-17 Jan. 1962	(1)
2065	ca. 150 counted	13 may 1962	ORDW62b
2066	always in small no.'s in pineapple field irrigation ponds (HDFG)	(June 1962)	ORDW62b
2067	HDFG: 356, annual waterfowl count	14-18 Jan. 1963	(1)
2068	HDFG: 485, annual waterfowl count	15 Jan. 1964	(1)
2069	HDFG: 184, annual waterfowl count	14 Jan. 1965	(1)
2070	HDFG: 242, annual waterfowl count	13-14 Jan. 1966	(1)
2071	HDFG: 209, annual waterfowl count	13-16 Jan. 1967	(1)
2072	HDFG: 175, annual waterfowl count	8-10 Jan. 1968	(1)
2073	HDFG: 565, annual stilt census	24 Jul. 1968	(1)
2074	HDFG: 162, annual waterfowl count	13-14 Jan. 1969	(1)
2075	HDFG: 785, annual stilt count	24 Jul. 1969	(1)
2076	HDFG: officially classed as rare	1969	(7)
2077	HDFG: 322, annual waterfowl count	13-15 Jan. 1970	(1)

2078	HDFG: 491, annual stilt count	7 Aug. 1970	(1)
2079	HDFG: 362, annual waterfowl count	Jan. 1971	(2)
2080	HDFG: 369, annual stilt count	27 Jul. 1971	(1)
2081	HDFG: 342, annual waterfowl count	Jan. 1972	(2)
2082	HDFG: 114 censused	12 Apr. 1972	(1)
2083	HDFG: 509, annual waterfowl count	Jan. 1973	(2)
2084	HDFG: 469, annual stilt count	8 Aug. 1973	(1)
2085	HDFG: 107, annual waterfowl count	Jan. 1974	(2)
2086	HDFG: 110, annual stilt count	Jan. 1975	(2)
2087	HDFG: ...summer and winter counts were conducted during ideal weather conditions as rains which tend to disperse waterbird populations and make accurate coverage difficult did not occur this year, consequently this year's summer count was higher than last year's	1 Jul. 1975	(2)
2088	HDFG: 507, annual stilt count	1 Aug. 1975	(2)
2089	HDFG: 249, annual waterfowl count	15 Jan. 1976	(2)
2090	HDFG: 439, annual waterfowl count	Jan. 1977	(2)
2091	HDFG: High tides during the summer count may have concentrated stilts away from shorelines and account for the increase of 231 sighted this year compared to last summer	1 Jul. 1976 - 30 June 1977	(2)
2092	HDFG: 570, annual stilt count	27-28 Jul. 1977	(2)
2093	HDFG: 396, annual waterfowl count	12-13 Jan. 1978	(2)

2094	HDFG: 211, annual waterfowl count	15,16,20 Jan. 1979	(5)
2095	HDFG: 533, annual stilt count	1-2 Aug. 1979	(5)
2096	HDFG: 384, annual waterfowl count	14-16 Jan. 1980	(5)
2097	HDFG: 588, annual stilt count	31 Jul., 1 Aug. 1980	(5)
2098	Coleman: data from 3-year study of a total of 415 nests indicated: 1) nesting occurred from mid-February and mid-August, with a peak in May; 2) 80% of the nests were located on islands, usually close to the water, on bare ground surrounded by little or no cover; 3) mean clutch size was 3.6 eggs; 4) both parents share equally in incubation which lasted 23-26 days; 5) mean hatching success was 57% (2.0 eggs/nest); 6) mean fledging success was 13% (0.47 fledglings/nest) (23% of the hatch); 7) the family group of parents and juveniles was retained throughout the following fall and winter; 8) juvenal plumage, resembling that of <u>Himantopus mexicanus mexicanus</u> , is retained for 7-9 months after fledging.	1978-1980	(51)

2099	HDFG: 418, annual waterfowl count	12-14 Jan. 1981	(5)
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UNDESIGNATED LOCALITY

2100	specimen collected (Honolulu)	21 Feb. 1870	STEL88
2101	specimens obtained (near Koko Head)	1887/1888	WILS93
2102	familiar...some years ago near the railroad a mile out of Honolulu...now rarely seen	(1892-1897)	PERR03
2103	Palmer: obtained 2 specimens	6 May 1893	(10)
2104	unnamed collector obtained 5 specimens	June, Aug. 1895	(10)
2105	Wilson: collected 4 specimens	(1896?)	(10)

MULTIQUADRANGLE

Pearl Harbor National Wildlife Refuge (West Loch & Pearl City Units)

2106	USFWS: 83 ave. daily use	Oct.-Dec. 1979	(13)
2107	USFWS: 100 ave. daily use	Jan.-Mar. 1980	(13)
2108	USFWS: 33 ave. daily use	Apr.-June 1980	(13)
2109	USFWS: 33 ave. daily use	Jul. Sep. 1980	(13)
2110	USFWS: 89 ave. daily use	Oct.-Dec. 1980	(13)
2111	USFWS: 100 ave. daily use	Jan.-Mar. 1981	(13)
2112	USFWS: 50 ave. daily use	Apr.-June 1981	(13)
2113	USFWS: 50 ave. daily use	Jul.-Sep. 1981	(13)

Waipahu Flats - Waikele - Apokaa - Walker's Bay - West Loch

2114	25 seen	22 Dec. (1944)	COGH45
2115	9 seen	9 Dec. 1950	PETH51
2116	91 counted	6 Sep. 1953	TITM53
2117	340 in one flock	27 Sep. 1953	HATG53a
2118	300+	25 Oct. 1953	GOSG53
2119	scores seen	28 Feb. 1954	BOTI54
2120	84 counted	13 Feb. 1955	PYLL55
2121	301 counted	14 Aug. 1955	PYLB55
2122	numerous	23 Oct. 1955	GOSG55

2123	236 counted	13 Nov. 1955	WILE56
2124	usual number	11 Dec. 1955	ROCR56a
2125	2 seen	29 Jan. 1956	GOSG56a
2126	numerous	12 Feb. 1956	ANON56d
2127	0 (high tide)	26 Mar. 1956	GOSG56b
2128	150 estimated	23 Sep. 1956	HATG56
2129	150+ seen	25 Nov. 1956	HANC57b
2130	450 counted	13 Jan. 1957	ROCR57a
2131	300 counted	25 Aug. 1957	STEE57
2132	great number	27 Oct. 1957	SMAM57
2133	HDFG: 340, annual waterfowl count	14-17 Jan. 1958	(1)
2134	large numbers	26 Jan. 1958	LABA58
2135	2 seen	23 Mar. 1958	ROSM59
2136	numerous	10 Aug. 1958	SMAM58
2137	present	22 Mar. 1958	RIGM59
2138	HDFG: 467, annual waterfowl count	7-16 Jan. 1959	(1)
2139	450 counted	14 Feb. 1960	ROCR60
2140	present	10 Apr. 1960	RICH60
2141	many	22 May 1960	MENM60
2142	5 seen	20 Aug. 1961	ORDW61

2143	1 seen (high tide)	14 Jan. 1962	MENM62a
2144	a few	11 Mar. 1962	MENM62b
2145	3-30 on various visits	(June 1962)	ORDW62b
2146	HDFG: 119, annual waterfowl count	14-18 Jan. 1963	(1)
2147	HDFG: 206, annual waterfowl count	15 Jan. 1964	(1)
2148	HDFG: 47, annual water fowl count	14 Jan. 1965	(1)
2149	37 seen	26 Nov. 1965	DONW66b
2150	HDFG: 71, annual water fowl count	13-14 Jan. 1966	(1)
2151	Banko: 1	15 Apr. 1966	(18)
2152	Banko: 80	8 Jul. 1966	(18)
2153	Banko: 5	15 Jul. 1966	(18)
2154	Banko: 89	27 Aug. 1966	(18)
2155	Banko: several breeding pairs	1966	(18)
2156	HDFG: 96, annual waterfowl count	13-16 Jan. 1967	(1)
2157	HDFG: 44, annual waterfowl count	8-10 Jan. 1968	(1)
2158	HDFG: 357, annual stilt count	24 Jul. 1968	(1)
2159	40+	12 Jan. 1969	HODP69
2160	City and County sanitary fill has virtually prohibited stilt use of this (Waikale) once busy mudflat due to fill and smoke pollution	13-14 Jan. 1969	WALR69
2161	HDFG: 32, annual waterfowl count	13-14 Jan. 1969	(1)

2162	HDFG: 331, annual stilt count	24 Jul. 1969	(1)
2163	11 counted	30 Aug. 1969	MULW69a
2164	5+ seen	31 Aug. 1969	MULW69a
2165	5+ seen	1 Sep. 1969	MULW69a
2166	7 counted	3 Sep. 1969	MULW69a
2167	5 seen	6 Sep. 1969	MULW69a
2168	high of 33 from 13 visits	15 Oct. 1969	MULW70b
2169	several	11 Jan. 1970	ANON70c
2170	HDFG: 56, annual waterfowl count	13-15 Jan. 1970	(1)
2171	40+	20 Feb. 1970	KAIC70a
2172	23+	8 Mar. 1970	MULW70a
2173	HDFG: 277	7 Aug. 1970	(1)
2174	98 counted	13 Sep. 1970	ANON71a
2175	9 counted	8 Nov. 1970	MULW71b
2176	HDFG: 19, annual stilt count	27 Jul. 1971	(1)
2177	65 seen	10 Oct. 1971	MULW71a
2178	300-500 consistently use tidal flats of West Loch for feeding	(18 Oct. 1971)	KAIC71c
2179	Banko: 161	22 Oct. 1966	(18)
2180	82 present	9 Jan. 1972	MULW72c
2181	12+ (high tide)	27 Aug. 1972	KAIC72c

2182	42 sighted	10 Sept. 1972	MULW72f
2183	HDFG: 8	12 Apr. 1972	(1)
2184	10 present	27 Aug. 1972	KAIC72c
2185	14 sighted	10 Sep. 1972	MULW72f
2186	8 seen	14 Jan. 1973	WINW73
2187	HDFG: 15, annual stilt census	8 Aug. 1973	(1)
2188	22 spotted	14 Oct. 1973	SHAR74b
2189	HDFG: 4, annual waterfowl count	15 Jan. 1974	(21)
2190	1 fully fledged young	mid-Apr. (1974)	SHAR74a
2191	HDFG: 10, annual stilt count	1-5 Aug. 1974	(1)
2192	seen	27 Oct. 1974	WILE75a
2193	13 seen	8 Dec. 1974	WILE75b
2194	12	9 Feb. 1975	SEAW75
2195	HDFG: 51, annual stilt count	1 Aug. 1975	(1)
2196	HDFG: 63, annual water fowl count	15 Jan. 1976	(2)
2197	HDFG: 0, annual stilt census	4-5 Aug. 1976	(2)
2198	HDFG: 94, annual waterfowl count	13 Jan. 1977	(2)
2199	HDFG: 4, annual stilt count	27, 28 Jul. 1977	(2)
2200	HDFG: 35, annual waterfowl count	12-13 Jan. 1978	(2)
2201	HDFG: 0, annual stilt count	1-2 Aug. 1979	(5)

2202	HDFG: 0, annual waterfowl count	15, 16, 20 Jan. 1979	(5)
2203	HDFG: 5, annual stilt count	1, 2 Aug. 1979	(5)
2204	HDFG: 0, annual waterfowl count	14-16 Jan. 1980	(5)

Waipio - Waipahu - Dumps - Reservoirs - Air Strip - Sewage - Marsh

2205	seen	14 Jan. 1951	SHIE51
2206	5 seen	10 Jan. 1954	LABA54
2207	304 counted	22 Aug. 1954	PEDB54
2208	young one picked up	(1 May 1955)	ROCR55
2209	350 counted	14 Aug. 1955	PYLB55
2210	0 (clearing for housing, mangroves enchroaching)	18 Feb. 1961	HATG61a
2211	HDFG: 56, annual waterfowl count	14-18 Jan. 1963	(1)
2212	USFWS: 332	30 Aug. 1964	(12)
2213	250 counted	13 Sep. 1964	ORDW64c
2214	160 counted	11 Oct. 1964	ROCR64
2215	200 seen	25 Oct. 1964	ORDW64d
2216	3 seen (last of the shorebird areas near Wiapio; City Dump is going!)	9 May 1965	KOJU65a
2217	115 counted	18 July 1965	DONW65b
2218	17 counted	12 Sept. 1965	CASE65
2219	43 counted	10 Oct. 1965	WALL66

2220	40 seen	14 Nov. 1965	ORWD65
2221	Banko: 9 incl. 3 nests (4-4-3 eggs)	15 Apr. 1966	(18)
2222	Banko: 0 (marsh dry)	1 July 1966	(18)
2223	Banko: 42	8 July 1966	(18)
2224	Banko: 0	15 July 1966	(18)
2225	Banko: 120	24 Aug. 1966	(18)
2226	Banko: 27	27 Aug. 1966	(18)
2227	30-40 estimated	11 Sep. 1966	ORDW66a
2228	Banko: 30-50	22 Oct. 1966	(18)
2229	230+ counted	8 Nov. 1966	ORDW66b
2230	ca. 7	26 Dec. 1966	ANON67a
2231	380 counted	23 July (1967)	GAUJ67b
2232	175 counted, incl. 1 downy young	29 July (1967)	GAUJ67b
2233	HDFG: 20 annual stilt count	24 July 1968	(1)
2234	144 counted	1 Nov. 1968	KAIC68c
2235	ca. 33 observed	2 Nov. 1968	KAIC68c
2236	38 seen	10 Nov. 1968	KAIC68b
2237	105 counted	28 Nov. 1968	KAIC69a
2238	37 counted	8 Dec. 1968	KAIC69a
2239	7 seen	12 Jan. 1969	HODP69

2240	present	9 Mar. 1969	KAIC69b
2241	HDFG: 130 annual waterfowl count	13-15 Jan. 1970	(1)
2242	HDFG: 0	12 Apr. 1972	(1)
2243	0 seen (Waipahu Dump dry and apparently pau)	27 Aug. 1972	KAIC72c
2244	HDFG: 0, annual waterfowl count	15 Jan. 1974	(1)
2245	HDFG: 30, annual stilt count	1-5 Aug. 1974	(1)
2246	HDFG: 42, annual stilt count	1 Aug. 1975	(2)
2247	HDFG: 4, annual waterfowl count	15 Jan. 1976	(2)
2248	HDFG: 26, annual stilt count	4-5 Aug. 1976	(2)
2249	HDFG: 3, annual water count	13 Jan. 1977	(2)
2250	HDFG: 166, annual stilt count	27, 28 Jul. 1977	(2)
2251	HDFG: 8, annual waterfowl count	12-13 Jan. 1978	(2)
2252	HDFG: 35, annual stilt count	27-28, 30 Jul. 1978	(5)
2253	HDFG: 32, annual waterfowl count	15-16, 20 Jan. 1979	(5)
2254	HDFG: 58, annual stilt count	1, 2 Aug. 1979	(5)
2255	HDFG: 48, annual waterfowl count	14, 15, 16 Jan. 1980	(5)
Waipio - Waipahu - Settlement Basins			
2256	54 seen	4 Nov. 1965	DONW66a
2257	13 noted	17 Nov. 1965	DONW66b
2258	Banko: 7	15 Jul. 1966	(18)

2259	Banko: at least 445 censused (replicate counts of 471-459-446-445 during high tide and strong wind)	15 Jul. 1966	(18)
2260	Banko: 240	24 Aug. 1966	(18)
2261	large group	11 Sep. 1966	ORDW66a
2262	large flocks	10 Oct. 1966	DONW66c
2263	Banko: 5	22 Oct. 1966	(18)
2264	present	12 Mar. 1967	GAUJ67a
2265	75 seen	10 Sep. 1967	GAUJ67b
2266	105+	13 Oct. 1968	KAIC68d
2267	36	1 Nov. 1968	KAIC68c
2268	ca. 40	15 Nov. 1968	KAIC68c
2269	50 at least	14 Sep. 1969	DONW69b
2270	243 counted	4 Oct. (1969)	MULW69b
2271	high count of 50 (from 13 visits)	9 Oct.-30 Nov. 1969	MULW70b
2272	present	12 Oct. 1969	KAIC69c
2273	600+ counted	(15 Jul. 1970)	(22)
2274	HDFG: 21, annual stilt count	7 Aug. 1970	(1)
2275	620	10 Aug. 1970	ANON70d
2276	344	17 Aug. 1970	ANON70d
2277	180	13 Sep. 1970	ANON71a
2278	15+ seen	11 Oct. 1970	MULW71

2279	family seen	15 Jul. (1971)	ANON71c
2280	125+	(12 Sep. 1971)	MULW71
2281	99 counted	10 Oct. 1971	MULW71
2282	175+	27 Aug. 1972	KAIC72c
2283	140+	10 Sep. 1972	MULW72f
2284	40 seen	12 Nov. 1972	WINW73a
2285	HDFG: 289, annual stilt count	8 Aug. 1973	(1)
2286	60 observed	14 Oct. 1973	SHAR74b
2287	HDFG: 107	29 Oct. 1973	(1)
2288	HDFG: 0	15 Jan. 1974	(1)
2289	21 seen	8 Sept. 1974	WILE74c
2290	HDFG: 107	29 Oct. 1974	(21)
2291	HDFG: 195, annual stilt count	1 Aug. 1975	(1)
2292	135 counted	12 Oct. 1975	BURT75
2293	USFWS: 230	12 Oct. 1975	(13)
2294	HDFG: 499, annual stilt count	18 Jul. 1976	(2)
2295	token numbers	11 Sep. 1977	STEM77
2296	generally 100-200	summer and fall 1977	PYLR78b
2297	HDFG: 525, annual stilt count	1977	(2)
2298	77, high count	7 Jan. 1978	PYLR78c

2299	HDFG: 163, annual stilt count (drainage of the basins was contributing factor for reduced population	1978	(2)
2300	many wintered	(1977-1978)	PYLR78c
2301	HDFG: 11, annual waterfowl count	15, 16, 20 Jan. 1979	(5)
2302	HDFG: 45, annual stilt count	1, 2 Aug. 1979	(5)
2303	HDFG: 52, annual waterfowl count	14, 15, 16 Jan. 1980	(5)
2303a	Coleman: mean breeding population of 50 censused / Waipio	1978-1980	(51)
2304	ca. 500 conservative count	20 Aug. 1950	ROCR50
2305	a number	13 Jan. 1963	ORDW63c
2306	some 40	10 Feb. 1963	LABA63
2307	500+	28 Sep. 1963	ORDW63e
2308	1 or 2 seen	12 Apr. 1964	LABA64
2309	approximately 12	13 Sep. 1964	ORDW64c
2310	106 seen	11 Oct. 1964	ROCR64
2311	12 seen	25 Oct. 1964	ORDW64d
2312	seen	14 Feb. 1965	ANON65b
2313	16 counted	12 Sep. 1965	KOJU65b
2314	100+ seen	6 Nov. 1966	ORDW66b
2315	50 estimated	12 Nov. 1967	PYLR67
2316	0 seen	11 Feb. 1968	GAUJ68a

2317	6 seen	10 Mar. 1968	GAUJ68a
2318	HDFG: 14, annual stilt count	24 Jul. 1968	(1)
2319	HDFG: 145, annual stilt count	24 Jul. 1969	(1)
2320	HDFG: 58, annual stilt count	27 Jul. 1971	(1)
2321	several seen	8 Sep. 1974	WILE74c
2322	3 seen	27 Oct. 1974	WILE75a
2323	12 seen	8 Dec. 1974	WILE75b
2324	HDFG: 24, annual waterfowl count	15 Jan. 1976	(2)
2325	599+	9 Aug. 1976	PYLR77
2326	550+	5 Sep. 1976	PYLR77
2327	ca. 300	12 Sep. 1976	PYLR77
2328	140-290	Oct., early Nov. 1976	PYLR77
2329	90	20 Nov. 1976	PYLR77
2330	50	2 Dec. 1976	PYLR77
2331	100 at least	9 Jan. 1977	PYLR77
2332	HDFG: 79, annual waterfowl count	13 Jan. 1977	(2)
2333	176 seen	11 Sep. 1977	STEM77
2334	163, Christmas Count	18 Dec. 1977	STEM78
2335	HDFG: 92	12-13 Jan. 1978	(2)
2336	counted at least 175 but recorded only 150 due to	9 Jul. 1978	LEPJ78

2337	HDFG: 110, annual stilt count	27, 28, 30 Jul. 1978	(5)
2338	62, Christmas Count	16 Dec. 1978	STEM79
2339	seen	12 Oct. 1980	DONP80
2340	100+ seen	15 Sep. 1981	PYLR81c

MULTILOCALITY

2341	45 censused, Christmas Count / Kaelepulu and Kuapa Ponds	26 Dec. 1949	HATG50
2342	8 censused, Christmas Count / Kaelepulu, Kuapa Ponds	31 Dec. 1950	HATG50b
2343	6 seen / marshy reach of Pearl Harbor...on way to Palehua	23 Aug. 1953	CHAH53
2344	12 seen, Christmas Count / 21 observers in 11 parties; 7 1/2 mile radius centering 2/5 mile NNE of Nuuanu Pali, including Ulupau Head, Kuliouou Pond and Aiea Trail	26 Dec. (1955)	BALH55
2345	157 censused, annual waterfowl count / Pearl Harbor	4-10 Jan. 1956	(1)
2346	91 counted / West Loch, Kuliouou Park, Bellows Field, Kahana Bay, Kahuku	26 Aug. 1956	ROCR56b
2347	35 censused, Christmas Count / Kaelepulu Pond and Kailua	25 Dec. 1958	HATG57
2348	24 censused, Christmas Count / Kaelepulu Pond and Kailua	22 Dec. 1957	ANON58
2349	58 censused, Christmas Count / Kaelepulu Pond and Kailua...Kaelepulu..."already in the process of excavation for the planned housing development	21 Dec. 1958	ANON59

2350	4 censused, Christmas Count / Salt Lake (telescope) Damon Pond...Damon "now a complete mass of mangrove... suggest abandonment" (for Christmas count)	21 Dec. 1958	ANON59
2351	68 censused, Christmas Count / Kuliouou and Kuapa Pond	27 Dec. 1959	ANON60a
2352	43 censused, Christmas Count / Kaelepulu Pond and Kailua...count at Kaelepulu low due to drainage	27 Dec. 1959	ANON60a
2353	substantial numbers / various spots about Ewa and West Loch	12 June 1960	SCHP60
2354	55 censused, annual waterfowl count / Pearl Harbor	10-13 Jan. 1961	(1)
2355	approximately 80 birds / Kuapa or Paiko	up until Jan. 1962	ORDW62b
2356	39 censused, annual waterfowl count / Waipio - Ewa	15-17 Jan. 1962	(1)
2357	52 censused, Christmas Count / Paiko Laggon, Kuapa Pond	23 Dec. 1962	ANON62
2358	75 censused, Christmas Count / Paiko Lagoon, Kuapa Pond	29 Dec. 1963	ANON64
2359	64 censused, Christmas Count / Paiko Lagoon, Kuapa Pond	27 Dec. 1964	ANON65a
2360	4 seen / in a small marsh on the Campos Ranch makai of the canal...Kaelepulu Pond area	16-17 Jul. 1965	DONW65b
2361	4 counts by biologists ave. 31; range 21-44; breeding probable / Kuapa Pond, Paiko Lagoon	past few years to 1966 (11)	
2362	42 censused, Christmas Count / Paiko Lagoon, Kuapa Pond	2 Jan. 1966	ANON66a
2363	47 censused, Christmas Count / Paiko Lagoon, Kuapa Pond	26 Dec. 1966	ANON67a

2364	3 censused, Christmas Count / Paiko Lagoon, Kuapa Pond	31 Dec. 1967	ANON68
2365	none recorded, annual stilt count / Middle and East Loch, Pearl Harbor	24 Jul. 1968	(1)
2366	one seen / Hawaii Kai tidal flats near boat ramp	16 Nov. 1968	(12)
2367	10 censused, Christmas Count / Bellows Field, Saddle City, Kaelepulu Pond	28 Dec. 1969	ANON70b
2368	30 censused, Christmas Count / Kuapa Pond... "bid goodbye...pau" Paiko Lagoon...30 found	28 Dec. 1969	ANON70b
2369	22 censused, Christmas Count / Sand Island, Keehi Lagoon (telescope), Salt Lake, Nuuanu Reservoirs	28 Dec. 1969	ANON70b
2370	sighted / drive along Kalaniana'ole to Makapuu	(written Apr. 1970)	YUEH70a
2371	2 censused, Christmas Count / Bellows Field, Saddle City, Kaelepulu Pond	27 Dec. 1970	MULW71f
2372	17 censused / Diamond Head Crater to Paiko Lagoon	27 Dec. 1970	MULW71f
2373	73 censused / Sand Island, Keehi Lagoon (telescope), Salt Lake, Moanalua Gardens, Nuuanu Valley	27 Dec. 1970	MULW71f
2374	maximum...seen was 87...76 together on one occasion (from total of 60 censuses) / Keehi Lagoon and environs	12 Dec. 1970 - 28 Apr. 1971	WALR71
2375	none seen on 60 censuses with exception of one or two seen on Fort Kamehameha / Keehi Lagoon and environs	31 Jan.-30 Apr. 1971	WALR71
2376	2 censused, annual stilt count / Bellows Air Force Base	27 Jul. 1971	(1)
2377	105 observed / Keehi Lagoon...including the Ft. Kamehameha area	13 Dec. 1971	KAIC72a

2378	78 censused, Christmas Count / Sand Island, Keehi Lagoon (telescope), Salt Lake, Moanalua Gardens, Nuuanu Valley	26 Dec. 1971	MULW72a
2379	16 censused, Christmas Count / Diamond Crater to Paiko Lagoon	26 Dec. 1971	MULW72a
2380	11 censused, Christmas Count / Bellows Field, Saddle City, Kaelepulu Pond	26 Dec. 1971	MULW72a
2381	less than 20 / in the Upper West Loch and Walker Bay areas combined	9 Apr. 1972	MULW72d
2382	3 censused / Bellows Field, Kaelepulu Pond	17 Dec. 1972	MULW73a
2383	50 censused / Sand Island, Keehi Lagoon...offshore and bay through telescope	17 Dec. 1972	MULW73a
2384	15 censused / Diamond Head Crater to Paiko Lagoon	17 Dec. 1972	MULW73a
2385	5 censused / Kaelepulu Pond, Bellows Field	29 Dec. 1973	WILE74b
2386	2 censused / Diamond Head Crater, Kaimuki to Paiko Lagoon	29 Dec. 1973	WILE74b
2387	16 censused / Moanalua Gardens, Nuuanu Valley, Salt Lake, Sand Island, Keehi Lagoon (offshore and through telescope)	22 Dec. 1974	WILE75d
2388	2 censused / Kaelepulu Pond, Bellows Field	22 Dec. 1974	WILE75d
2389	HDFG: 0 censused / Kawainui, Hamakua Drive	13 Jan. 1977	(2)
2390	seen feeding / Kaluapuhi Pond...east side of Kaneohe Air Station	15 May 1977	CAMG77
2391	Shallenberger: recorded a maximum of three at Kualoa Pond and none at Molii / Molii-Kualoa Fish Ponds	10, 28 May 1977	(3)

2392	Shallenberger: not recorded on survey / Kahana Valley wetland and Bay	7 May, 31 Jul. 1977	(3)
2393	4 seen / wet pasture along Kaelepulu Canal	22 Oct. 1977	PYLR78b
2394	69 censused, Christmas Count / Kaneohe bay Drive, Moku Manu (Sector 9)	18 Dec. 1977	PYLR78a
2395	23 censused, Christmas Count / Sand Island, Salt Lake, Moanalua to Nuuanu (Sector 2)	18 Dec. 1977	PYLR78a
2396	3 censused, Christmas Count / Waimanalo, Bellows Field, Kaelepulu, Maunawili (Sector 7)	18 Dec. 1977	PYLR78a
2397	4 censused, Christmas Count / Hahaione, Kuliouou, Paiko Lagoon (Sector 6)	18 Dec. 1977	PYLR78a
2398	87 censused, Christmas Count / Pearl Harbor National Wildlife Refuge (West Loch and Pearl City Units)	18 Dec. 1977	STEM78
2399	Shallenberger: found in Pearl Harbor Wetlands in far greater numbers than all other endangered waterbirds put together. In some recent surveys, nearly half of the recorded Statewide population was distributed throughout the Pearl Harbor sites (Honouliuli, Waipio Peninsula, Pearl city (Waiawa) Peninsula) / Pearl Harbor Wetlands (including Pearl Harbor NWR)	(1977)	(3)
2400	Shallenberger: Our survey was complicated by difficulty in obtaining independent access, so we rely heavily upon the historical data in evaluating the different sites / Pearl Harbor Wetlands (including Pearl Harbor NWR)	(1977)	(3)
2401	7 censused, Christmas Count / Pearl Harbor NWR (West Loch & Pearl City Units?)	16 Dec. 1978	STEM79
2402	3 censused, Christmas Count / Aiea, Pearl City, Waipahu	16 Dec. 1978	STEM79

2403	17 censused, Christmas Count / Salt Lake; Moanalua Gardens	17 Dec. 1978	PYLR79a
2404	3 censused, Christmas Count / Waimanalo; Bellows AFS; Kaelepulu Pond	17 Dec. 1978	PYLR79a
2405	4 censused, Christmas Count / Lanikai area; Kawainui dike	17 Dec. 1978	PYLR79a
2406	92 censused, Christmas Count / Kaneohe Bay Drive; Kaneohe MCAS; Kawainui Marsh, Quarry Road, Dump	17 Dec. 1978	PYLR79a
2407	7 censused, Christmas Count / Lanikai; Kawainui dike; Hamakua Canal	16 Dec. 1979	PYLR80
2408	124 censused, Christmas Count / Kaneohe Bay Drive; Kaneohe MCAS	16 Dec. 1979	PYLR80
2409	2 censused, Christmas Count / Diamond Head Crater; Kahala; Paiko Lagoon	16 Dec. 1979	PYLR80
2410	22 censused, Christmas Count / Salt Lake; Nuuanu; Moanalua and Keehi Parks	16 Dec. 1979	PYLR80
2411	9 censused, Christmas Count / Waimanalo; Bellows AFS; Kaelepulu; Mauna-wili	16 Dec. 1979	PYLR80
2412	236 censused, christmas Count / Waipio Peninsula & Pearl Harbor NWR	Dec. 1979	STEM81
2413	HDFG: 5 censused / Kaelepulu Pond and Flood Control	14, 15, 16 Jan. 1980	(5)
2414	5 censused, Christmas Count / Waimanalo; Bellows AFS; Kaelepulu Pond; Mauna-wili	(Dec.) 1980	PYLR81b
2415	189 censused, Christmas Count / Waipio Peninsula & Pearl Harbor NWR	(Dec.) 1980	STEM81
2416	4 censused, christmas Count / Lanikai; Kawainui dike and marsh; Hamakua Drive; Quarry Road; Kapaa Landfill	(Dec. 1980)	PYLR81b

2417	10 censused, Christmas Count / Salt Lake; Moanalua Gardens; Nuuanu Valley; Iwilei	(Dec.) 1980	PYLR81b
2418	94 censused, Christmas Count / Kaneohe Bay Drive; Kaneohe MCAS	(Dec.) 1980	PYLR81b

Waianae District

QUADRANGLE/LOCALITY

KAENA

Kapaluaa Bridge-Stream

2419	HDFG: 0	4-5 Aug. 1976	(2)
2420	HDFG: 0	13 Jan. 1977	(2)
2421	HDFG: 0	12-13 Jan. 1978	(2)
2422	HDFG: 0	1-2 Aug. 1979	(5)
2423	HDFG: 0	31 Jul., 1 Aug. 1980	(5)

Mokuleia - Makaleha Stream - Dillingham Pond - Airfield - Ranch

2424	ca. 24...extensive mudflat behind Dillingham Airfield	21 May 1973	ANON73
2425	HDFG: 0	1 Aug. 1975	(2)
2426	HDFG: 0	15 Jan. 1976	(2)
2427	HDFG: 0	4-5 Aug. 1976	(2)
2428	HDFG: 0	13 Jan. 1977	(2)
2429	HDFG: 0	27-28 Jul. 1977	(2)

2430	HDFG:	0	12-13 Jan. 1978	(2)
2431	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2432	HDFG:	0	1-2 Aug. 1979	(5)
2433	HDFG:	0	14-16 Jan. 1980	(5)

Mokuleia Quarry

2434	HDFG:	to be indcluded in future censuses due to recent waterbird sightings	beginning July 1981	(5)
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HALEIWA

Haleiwa lotus Farm - Ponds - Wetlands

2435	HDFG:	0	15 Jan. 1976	(2)
2436	HDFG:	2	12-13 Jan. 1978	(2)
2437	HDFG:	0	27, 28, 30 Jul. 1978	(5)
2438	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2439	HDFG:	0	1-2 Aug. 1979	(5)
2440	HDFG:	15	14-16 Jan. 1980	(5)

Helemano Reservoir

2441	HDFG:	0	12-13 Jan. 1978	(2)
2442	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2443	HDFG:	0	1-2 Aug. 1979	(5)
2444	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
2445	HDFG:	to be excluded in future censuses due to non-use	Jul. 1981	(5)

Kaiaka Bay		
2446	HDFG: 0	4-5 Aug. 1976 (2)
Kawailo (Meadow Gold)		
2447	HDFG: 0	1, 2 Aug. 1979 (5)
Ukoa - Pond - Marsh		
2448	HDFG: 0	1 Aug. 1975 (2)
2449	HDFG: 0	15 Jan. 1976 (2)
2450	HDFG: 0	4-5 Aug. 1976 (2)
2451	HDFG: 0	13 Jan. 1977 (2)
2452	HDFG: 0	27-28 Jul. 1977 (2)
2453	Shallenberger: 26 on pond	(1977) (3)
2454	HDFG: 29	12-13 Jan. 1978 (2)
2455	HDFG: 0	27, 28, 30 Jul. 1978 (5)
2456	HDFG: 5	15, 16, 20 Jan. 1979 (5)
2457	HDFG: 0	1-2 Aug. 1979 (5)
2458	HDFG: 0	14-16 Jan. 1980 (5)
Waialua		
2459	Banko: Wilson collected 1 specimen	Oct. 1888 (10)
Waialua Settling Ponds		
2460	HDFG: 18	1, 2 Aug. 1979 (5)

2461	HDFG:	2	14-16 Jan. 1980	(5)
2462	HDFG:	0	31 Jul., 1 Aug. 1980	(5)
WAIANAE				
2463	USFWS:	3	14 May 1968	(12)
2464	USFWS:	15	17 Oct. 1968	(12)
2465	USFWS:	16	18 Nov. 1968	(12)
2466	USFWS:	15+ seen to use the Golf Course	(6 Dec. 1968)	(12)
2467	HDFG:	3	27 Jul. 1971	(1)
2468	HDFG:	0	12 Apr. 1972	(1)
2469	HDFG:	2	8 Aug. 1973	(1)
2470	HDFG:	2	11 Jan. 1974	(1)
2471	HDFG:	5	15 Jan. 1974	(1)
2472	HDFG:	9	1-5 Aug. 1974	(1)
2473	HDFG:	0	1 Aug. 1975	(2)
2474	HDFG:	0	15 Jan. 1976	(2)
2475	HDFG:	0	4-5 Aug. 1976	(2)
2476	HDFG:	8	13 Jan. 1977	(2)
2477	HDFG:	0	27-28 Jul. 1977	(2)
2478	HDFG:	4	12-13 Jan. 1978	(2)

Waianae - Dump - Reservoir - Valley

2479	HDFG:	1	13-16 Jan. 1967	(1)
2480	HDFG:	2 (Dump)	24 Jul. 1968	(1)
2481	HDFG:	9 (Reservoir)	24 Jul. 1968	(1)
2482	HDFG:	9	24 Jul. 1969	(1)
2483	HDFG:	0	1 Aug. 1975	(1)
2484	HDFG:	0	15 Jan. 1976	(2)
2485	HDFG:	0	13 Jan. 1977	(2)

Yamaguchi Farm, Waianae

2486	HDFG:	3	1-5 Aug. 1974	(1)
2487	HDFG:	0	4-5 Aug. 1976	(2)
2488	HDFG:	0	13 Jan. 1977	(2)
2489	HDFG:	0	27-28 Jul. 1977	(2)

SCHOFIELD BARRACKS

Lualualei Naval Ammunition Depot

2490	HDFG:	7	1-5 Aug. 1974	(1)
2491	HDFG:	4	1 Aug. 1975	(1)
2492	HDFG:	0	15 Jan. 1976	(2)
2493	HDFG:	0	4-5 Aug. 1976	(2)
2494	HDFG:	3	13 Jan. 1977	(2)

2495	HDFG:	0	27-28 Jul. 1977	(2)
2496	HDFG:	0	12-13 Jan. 1978	(2)
2497	HDFG:	0	27, 28, 30 Jul. 1978	(5)
2498	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2499	HDFG:	0	1-2 Aug. 1979	(5)
2500	HDFG:	0	15, 16 Jan. 1980	(5)

EWA

Barbers Point - Ewa

2501	HDFG:	12	15 Jan. 1964	(1)
2502	HDFG:	28	24 Jul. 1968	(1)

Campbell Industrial Park

2503	HDFG:	1	1 Aug. 1975	(2)
2504	HDFG:	0	15 Jan. 1976	(2)
2505	HDFG:	0	4-5 Aug. 1976	(2)
2506	HDFG:	0	13 Jan. 1977	(2)
2507	HDFG:	0	27-28 Jul. 1977	(2)
2508	HDFG:	0	12-13 Jan. 1978	(2)
2509	HDFG:	0	27, 28, 30 Jul. 1978	(5)
2510	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2511	HDFG:	0	1-2 Aug. 1979	(5)

2512	HDFG:	0	14-16 Jan. 1980	(5)
Malakole				
2513	HDFG:	4	14-17 Jan. 1958	(1)
2514	HDFG:	2	7-16 Jan. 1959	(1)

Ko'olau District

WAIMEA

Waialeale Reservoir

2515	HDFG:	0	15 Jan. 1976	(2)
2516	HDFG:	1	13 Jan. 1977	(2)

Waimea Arboretum

2517	HDFG:	0	12-13 Jan. 1978	(2)
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Waimea Falls Park

2518	HDFG:	0	27, 28, 30 Jul. 1978	(5)
2519	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2520	HDFG:	0	1-2 Aug. 1979	(5)
2521	HDFG:	0	14-16 Jan. 1980	(5)

Waimea Stream

2522	HDFG:	0	13 Jan. 1977	(2)
2523	HDFG:	0	27-28 Jul. 1977	(2)

KAHUKU

James Campbell National Wildlife Refuge (Kii and Punamano Units)

2524	HDFG: nesting successful beyond all expectations (no numbers given)	Spring 1978	PYLR78d
2525	USFWS: 100 ave. daily use	Oct.-Dec. 1979	(13)
2526	USFWS: 79 ave. daily use	Jan.-Mar. 1980	(13)
2527	USFWS: 84 ave. daily use	Apr.-Jun. 1980	(13)
2528	USFWS: 77 ave. daily use	Jul.-Sep. 1980	(13)
2529	USFWS: 121 ave. daily use	Oct.-Dec. 1980	(13)
2530	USFWS: 35 ave. daily use	Jan.-Mar. 1981	(13)
3531	USFWS: 78 ave. daily use	Apr.-Jun. 1981	(13)
3532	USFWS: 50 ave. daily use	Jul.-Sep. 1981	(13)
3532a	a few present	15 Sep. 1981	PYLR81c

Kahuku (Kii) Pond(s) (now in James Campbell National Wildlife Refuge)

2533	seen	13 Jan. 1946	PEAG46
2534	5 seen	19 Jul. 1946	GRIP46
2535	26 counted	13 oct. 1946	ANON46
2536	5 seen (only a small area remains clear and unpolluted from decaying cane refuse)	12 Sep. 1948	HATG48b
2537	18 seen	14 Nov. 1948	ANON49a
2538	0 (Pond dry)	? Dec. 1948	ANON19b

2539	0 (Pond dry)	6 Sep. 1953	TITM53
2540	20-25 seen	1 Aug. 1954	GOSG54a
2541	many	13 Feb. 1955	PYLL55
2542	present	14 Aug. 1955	PYLB55
2543	less numerous than on earlier fall trips	23 Oct. 1955	GOSG55
2544	HDFG: 4	4-10 Jan. 1956	(1)
2545	44 counted	29 Jan. 1956	GOSG56a
2546	perhaps 50	23 Sep. 1956	HATG56
2547	15 seen	25 Aug. 1957	STEE57

Kahuku (Kii) Pond(s) (Continued)

2548	1 seen	26 Oct. 1958	HANC58a
2549	HDFG: 5	7-16 Jan. 1959	(1)
2550	present	25 Jan. 1959	MACM59
2551	50 counted	27 Sept. 1959	STEE59
2552	many	25 Oct. 1959	ROCR59
2553	0 (much plowing and grading...ponds drained away)	10 Jan. 1960	STEF60
2554	6 around pools left by drained ponds	11 Sept. 1960	ANON60c
2555	6	13 Nov. 1960	LUPD61a
2556	HDFG: 3	10-13 Jan. 1961	(1)
2557	0 (bulldozers at work...changes appalling...one small basin...only bit of water left...desolation almost complete)	18 Feb. 1961	HATG61a

2558	2 seen	29 Oct. 1961	CARR62
2559	HDFG: 7	15-17 Jan. 1962	(1)
1560	HDFG: 4	15-17 Jan. 1962	(1)
2561	fairly numerous (water much less - drainage going on - shallow pools scattered over 3/4 fields)	11 Nov. 1962	TITM62
2562	0 (Ponds almost dried up)	13 Jan. 1963	ORDW63c
2563	ca. 60	10 Mar. 1963	ORDW63d
2564	40-50, 3 pairs nesting	May 1963	HORL63
Kahuku (Kii) Pond(s) (Continued)			
2565	4 (rather dry)	9 Feb. 1964	ORDW64a
2566	87 censused	30 Aug. 1964	(12)
2567	100 counted	11 Oct. 1964	ROCR64
2568	HDFG: 29	13-14 Jan. 1966	(1)
2569	at least 10 (in 3 settlement basins)	10 Apr. 1966	BURJ66
2570	HDFG: 22	13-16 Jan. 1967	(1)
2571	2 seen	21 Jan. 1967	PYLL67
2572	present	12 Feb. 1967	DONW67b
2573	a few	12 Nov. 1967	PYLR67
2574	HDFG: 4	8-10 Jan. 1968	(1)
2575	0 (Ponds drained)	14 Jan. 1968	GAUJ68c
2576	0	10 Mar. 1968	GAUJ68a

2577	USFWS: 15	4 Apr. 1968	(12)
2578	USFWS: 18	11 Apr. 1968	(12)
2579	USFWS: 27	18 Apr. 1968	(12)
2580	USFWS: 29	2 May 1968	(12)
2581	over 50 counted	19 Sep. 1968	KAIC68e
2582	easily 135+	13 Oct. 1968	KAIC68d

Kahuku (Kii) Pond(s) (Continued)

2583	in some numbers	10 Nov. 1968	KAIC68b
2584	HDFG: 39 (incl. 1 yellow dyed bird from Maui)	13-14 Jan. 1969	(1)
2585	USFWS: 34 (incl. 1 yellow dyed bird from Maui)	14 Jan. 1969	(12)
2586	saw 1 yellow dyed bird	? Feb. 1969	ANON69c
2587	USFWS: (Pyle) reported 18 incl. 1 orange dyed bird	10 Feb. 1969	(12)
2588	HDFG: 143	24 Jul. 1969	(1)
2589	large numbers (beginning to dry up)	9 Nov. 1969	KAIC69d
2590	number present	11 Jan. 1970	ANON10c
2591	HDFG: 7	13-15 Jan. 1970	(1)
2592	50+ (enlarged pond)	20 Sep. 1970	KAIC70d
2593	only 6	11 Oct. 1970	MULW71a
2594	4 seen	8 Nov. 1970	MULW71b
2595	1 seen	18 Nov. 1971	KAIC71d

2596	8 seen	14 Mar. 1971	MULW71d
2597	USFWS: 6	31 Mar. 1971	(12)
2598	USFWS: 10	12 Apr. 1971	(12)
2599	36 censused....1 active + 5 possible nests found	29 Apr. 1971	OLSD71a
2600	35+ censused....7 seemed to be nesting	1 May 1971	KAIC71e
Kahuku (Kii) Pond(s) (Continued)			
2601	Bowles: 50-60	13 May 1971	ORDW62b
2602	65 seen, 7 active nests counted	1 June 1971	MULM71
2603	74 observed...appeared to be 7 active nests...12 known young	10 June 1971	KRIE71
2604	HDFG: 87	27 July 1971	(1)
2605	37 seen, about one-fourth to one-third seemed to be immatures	28 Aug. 1971	ANON71b
2606	73 counted	(12 Sep.) 1971	MULW71e
2607	29 counted	10 Oct. 1971	MULW71e
2608	HDFG: 3	12 Apr. 1972	(1)
2609	HDFG: 4 (in marsh, Pond unsuitable for stilt)	8 Aug. 1973	(1)
2610	HDFG: once supported a number (when a settling basin for Kahuku Sugar mill; sugar operations since terminated), now supports only a few when heavy rains leave puddles of water	1 Jul. 1973 - 30 June 1974	(21)
2611	HDFG: 0 (Pond unsuitable for stilt)	15 Jan. 1974	(1)

2612	HDFG:	0 (Pond unsuitable for stilt)	13 Feb. 1974	(1)
2613	HDFG:	0	23 Feb. 1974	(21)
2614	HDFG:	3	1 Aug. 1975	(2)
2615	HDFG:	0	15 Jan. 1976	(2)
2616	HDFG:	2	4-5 Aug. 1976	(2)

Kahuku (Kii) Pond(s) (Continued)

2617	USFWS:	9	13 Jan. 1977	(13)
2618	USFWS:	2	31 Jan. 1977	(13)
2619	USFWS:	1	10 June 1977	(13)
2620	USFWS:	4	11 June 1977	(13)
2621	USFWS:	3	15 June 1977	(13)
2622	USFWS:	6	25 June 1977	(13)
2623	USFWS:	6	27 June 1977	(13)
2624	USFWS:	4	27 July 1977	(13)
2625	USFWS:	5	28 July 1977	(13)
2626	USFWS:	3	1 Aug. 1977	(13)
2627	USFWS:	4	2 Aug. 1977	(13)
2628	USFWS:	2	3 Aug. 1977	(13)
2629	USFWS:	4	8 Aug. 1977	(13)
2630	USFWS:	3	9 Aug. 1977	(13)

2631	USFWS:	3	11 Aug. 1977	(13)
2632	USFWS:	2	12 Aug. 1977	(13)
2633	USFWS:	3	24 Aug. 1977	(13)
2634	USFWS:	2	27 Aug. 1977	(13)

Kahuku (Kii) Pond(s) (Continued)

2635	Shallenberger:	counted 5 on 3 surveys	5 May-27 Aug. 1977	(3)
2636	USFWS:	5	31 Aug. 1977	(13)
2637	USFWS:	3	11 Sep. 1977	(13)
2638	USFWS:	7	15 Sep. 1977	(13)
2639	USFWS:	11	19 Sep. 1977	(13)
2640	USFWS:	14	21 Sep. 1977	(13)
2641	USFWS:	11	22 Sep. 1977	(13)
2642	USFWS:	15	23 Sep. 1977	(13)
2643	USFWS:	18	26 Sep. 1977	(13)
2644	USFWS:	14	27 Sep. 1977	(13)
2645	USFWS:	38	28 Sep. 1977	(13)
2646	USFWS:	35	30 Sep. 1977	(13)
2647	32 counted		2 Oct. 1977	PYLR78b
2648	USFWS:	37	3 Oct. 1977	(13)
2649	USFWS:	28	4 Oct. 1977	(13)

2650	USFWS:	15	6 Oct. 1977	(13)
2651	USFWS:	9	12 Oct. 1977	(13)
2652	USFWS:	31	13 Oct. 1977	(13)

Kahuku (Kii) Pond(s) (Continued)

2653	USFWS:	24	15 Oct. 1977	(13)
2654	USFWS:	28	18 Oct. 1977	(13)
2655	USFWS:	24	19 Oct. 1977	(13)
2656	USFWS:	23	20 Oct. 1977	(13)
2657	USFWS:	24	28 Oct. 1977	(13)
2658	USFWS:	25	31 Oct. 1977	(13)
2659	USFWS:	27	10 Nov. 1977	(13)
2660	USFWS:	25	14 Nov. 1977	(13)
2661	USFWS:	28	15 Nov. 1977	(13)
2662	USFWS:	19	17 Nov. 1977	(13)
2663	USFWS:	18	24 Nov. 1977	(13)
2664	USFWS:	29	28 Nov. 1977	(13)
2665	26 current ave., fall pop.		Fall 1977	COLR78a
2666	USFWS:	23	1 Dec. 1977	(13)
2667	USFWS:	27	13 Dec. 1977	(13)
2668	USFWS:	32	15 Dec. 1977	(13)

2669	USFWS: 25	5 Jan. 1978	(13)
2670	USFWS: 31	12 Jan. 1978	(13)
Kahuku (Kii) Pond(s) (Continued)			
2671	31 (a high count)	12 Jan. 1978	PYLR78c
2672	USFWS: 21	31 Jan. 1978	(13)
2673	35 (a high count)	4 Feb. 1978	PYLR78c
2674	USFWS: 35+	5 Feb. 1978	(13)
2675	USFWS: 31	13 Feb. 1978	(13)
2676	USFWS: 29	14 Feb. 1978	(13)
2677	USFWS: 36	20 Feb. 1978	(13)
2678	USFWS: 32	22 Feb. 1978	(13)
2679	USFWS: 16	27 Feb. 1978	(13)
2680	USFWS: 26	3 Mar. 1978	(13)
2681	USFWS: 19	14 Mar. 1978	(13)
2682	USFWS: 22	15 Mar. 1978	(13)
2683	USFWS: 30	23 Mar. 1978	(13)
2684	USFWS: 27	11 Apr. 1978	(13)
2685	USFWS: 55	25 Apr. 1978	(13)
2686	active nest found	29 June 1978	COLR78a
2687	HDFG: 81	27, 28, 30 Jul. 1978	(5)

2688	USFWS:	46	2 Aug. 1978	(13)
2689	USFWS:	56	7 Aug. 1978	(13)
2690	USFWS:	59	8 Aug. 1978	(13)
2691	USFWS:	38	11 Aug. 1978	(13)
2692	USFWS:	35	14 Aug. 1978	(13)
2693	USFWS:	51	15 Aug. 1978	(13)
2694	USFWS:	28	16 Aug. 1978	(13)
2695	USFWS:	30	17 Aug. 1978	(13)
2696	USFWS:	21	18 Aug. 1978	(13)
2697	USFWS:	15	21 Aug. 1978	(13)
2698	USFWS:	3	6 Sep. 1978	(13)
2699	USFWS:	present	10 Sep. 1978	(13)
2700	USFWS:	33	12 Sep. 1978	(13)
2701	USFWS:	9	19 Sep. 1978	(13)
2702	USFWS:	92	19 Sep. 1978	(13)
2703	USFWS:	23	26 Oct. 1978	(13)
2704	USFWS:	15	1 Nov. 1978	(13)
2705	USFWS:	8	2 Nov. 1978	(13)
2706	USFWS:	6	3 Nov. 1978	(13)
2707	USFWS:	5	4 Nov. 1978	(13)

Kahuku (Kii) Pond(s) (Continued)

2708	USFWS:	6	6 Nov. 1978	(13)
2709	USFWS:	3	7 Nov. 1978	(13)
2710	USFWS:	1	9 Nov. 1978	(13)
2711	USFWS:	1	10 Nov. 1978	(13)
2712	USFWS:	13	13 Nov. 1978	(13)
2713	USFWS:	17	14 Nov. 1978	(13)
2714	USFWS:	13	15 Nov. 1978	(13)
2715	USFWS:	12	16 Nov. 1978	(13)
2716	USFWS:	4	27 Nov. 1978	(13)
2717	USFWS:	6	28 Nov. 1978	(13)
2718	USFWS:	- 6	30 Nov. 1978	(13)
2719	USFWS:	16	1 Dec. 1978	(13)
2720	USFWS:	19	2 Dec. 1978	(13)
2721	USFWS:	5	4 Dec. 1978	(13)
2722	USFWS:	15	5 Dec. 1978	(13)
2723	USFWS:	35	6 Dec. 1978	(13)
2724	USFWS:	9	7 Dec. 1978	(13)
2725	USFWS:	19	8 Dec. 1978	(13)

Kahuku (Kii) Pond(s) (Continued)

2726	USFWS:	3	9 Dec. 1978	(13)
2727	USFWS:	12	11 Dec. 1978	(13)
2728	USFWS:	6	12 Dec. 1978	(13)
2729	USFWS:	10	13 Dec. 1978	(13)
2730	USFWS:	4	14 Dec. 1978	(13)
2731	USFWS:	6	15 Dec. 1978	(13)
2732	USFWS:	5	18 Dec. 1978	(13)
2733	USFWS:	15	19 Dec. 1978	(13)
2734	USFWS:	7	20 Dec. 1978	(13)
2735	USFWS:	7	21 Dec. 1978	(13)
2736	USFWS:	15	22 Dec. 1978	(13)
2737	USFWS:	20	23 Dec. 1978	(13)
2738	USFWS:	21	24 Dec. 1978	(13)
2739	USFWS:	12	26 Dec. 1978	(13)
2740	USFWS:	19	27 Dec. 1978	(13)
2741	USFWS:	13	28 Dec. 1978	(13)
2742	USFWS:	31	29 Dec. 1978	(13)
2743	USFWS:	21	2 Jan. 1979	(13)

Kahuku (Kii) Pond(s) (Continued)

2744	USFWS:	30	3 Jan. 1979	(13)
2745	USFWS:	28	4 Jan. 1979	(13)
2746	USFWS:	33	5 Jan. 1979	(13)
2747	USFWS:	39	8 Jan. 1979	(13)
2748	USFWS:	34	9 Jan. 1979	(13)
2749	USFWS:	12	10 Jan. 1979	(13)
2750	USFWS:	23	12 Jan. 1979	(13)
2751	USFWS:	1	14 Jan. 1979	(13)
2752	USFWS:	5	15 Jan. 1979	(13)
2753	USFWS:	5	16 Jan. 1979	(13)
2754	USFWS:	19	17 Jan. 1979	(13)
2755	USFWS:	12	18 Jan. 1979	(13)
2756	USFWS:	14	19 Jan. 1979	(13)
2757	USFWS:	15	20 Jan. 1979	(13)
2758	HDFG:	9	15, 16, 20 Jan. 1979	(5)
2759	USFWS:	10	22 Jan. 1979	(13)
2760	USFWS:	5	23 Jan. 1979	(13)
2761	USFWS:	18	24 Jan. 1979	(13)

Kahuku (Kii) Pond(s) (Continued)

2762	USFWS:	11	25 Jan. 1979	(13)
2763	USFWS:	11	26 Jan. 1979	(13)
2764	USFWS:	10	31 Jan. 1979	(13)
2765	USFWS:	10	1 Feb. 1979	(13)
2766	USFWS:	12	2 Feb. 1979	(13)
2767	USFWS:	10	5 Feb. 1979	(13)
2768	USFWS:	14	6 Feb. 1979	(13)
2769	USFWS:	20	7 Feb. 1979	(13)
2770	USFWS:	26	8 Feb. 1979	(13)
2771	USFWS:	16	9 Feb. 1979	(13)
2772	USFWS:	5	12 Feb. 1979	(13)
2773	USFWS:	8	13 Feb. 1979	(13)
2774	USFWS:	8	14 Feb. 1979	(13)
2775	USFWS:	5	15 Feb. 1979	(13)
2776	USFWS:	11	18 Feb. 1979	(13)
2777	USFWS:	26	21 Feb. 1979	(13)
2778	USFWS:	10	22 Feb. 1979	(13)
2779	USFWS:	11	23 Feb. 1979	(13)

Kahuku (Kii) Pond(s) Continued)

2780	USFWS:	12	26 Feb. 1979	(13)
2781	USFWS:	11	27 Feb. 1979	(13)
2782	USFWS:	24	2 Mar. 1979	(13)
2783	USFWS:	35	3 Mar. 1979	(13)
2784	USFWS:	37	5 Mar. 1979	(13)
2785	USFWS:	14	6 Mar. 1979	(13)
2786	USFWS:	82	7 Mar. 1979	(13)
2787	USFWS:	48	9 Mar. 1979	(13)
2788	USFWS:	31	10 Mar. 1979	(13)
2789	USFWS:	51	12 Mar. 1979	(13)
2790	USFWS:	46	13 Mar. 1979	(13)
2791	USFWS:	55	14 Mar. 1979	(13)
2792	USFWS:	36	15 Mar. 1979	(13)
2793	USFWS:	28	16 Mar. 1979	(13)
2794	USFWS:	28	16 Mar. 1979	(13)
2795	USFWS:	44	20 Mar. 1979	(13)
2796	USFWS:	40	22 Mar. 1979	(13)
2797	USFWS:	45	26 Mar. 1979	(13)

Kahuku (Kii) Pond(s) (Continued)

2798	USFWS:	present	31 Mar. 1979	(13)
2799	USFWS:	54	3 Apr. 1979	(13)
2800	USFWS:	51	13 Apr. 1979	(13)
2801	USFWS:	61	18 Apr. 1979	(13)
2802	USFWS:	25	20 May 1979	(13)
2803	HDFG:	101	1,2 Aug.1979	(5)
2804	USFWS:	36	6 Sep. 1979	(13)
2805	USFWS:	14	10 Sep. 1979	(13)
2806	USFWS:	16	11 Sep. 1979	(13)
2807	USFWS:	25	13 Sep. 1979	(13)
2808	USFWS:	25	18 Sep. 1979	(13)
2809	USFWS:	33	24 Sep. 1979	(13)
2810	18	seen	14 Oct. 1979	CONS80
2811	USFWS:	40	17 Oct. 1979	(13)
2812	USFWS:	30	15 Nov. 1979	(13)
2813	HDFG:	47	14, 15, 16 Jan. 1980	(5)
	one approx. 1 week old chick killed and eaten by night heron...		8 may 1980	SUZA81
2813a	Coleman:	mean breeding population of 70 censused	1978-1980	(51)

Kahuku (Kii) Pond(s) (Continued)

2814	30+ seen	11 Jan. 1981	HARK81
2815	USFWS: 50	15 Nov.-15 Dec. 1981	(13)
2816	USFWS: 58	16 Dec. 1981-15 Jan. 1982	(13)
2817	USFWS: 86	16 Jan.-15 Feb. 1982	(13)
2818	USFWS: not censused	16 Feb.-31 Mar. 1982	(13)
2819	USFWS: 65	Apr. 1982	(13)
2820	USFWS: 8	May 1982	(13)
2821	USFWS: 89	June 1982	(13)

Kahuku (Punamamo) Pond(s) (now in James Campbell National Wildlife Refuge)

2822	USFWS: 3	4 Apr. 1968	(12)
2823	USFWS: 17	11 Apr. 1968	(12)
2824	USFWS: 15	18 Apr. 1968	(12)
2825	USFWS: 18	2 May 1968	(12)
2826	USFWS: 14	9 May 1968	(12)
2827	HDFG: 2	7 Aug. 1970	(1)
2828	9 seen, no nests or young seen	10 June 1971	KRIE71
2829	HDFG: 7	27 July 1971	(1)
2830	HDFG: 30	12 Apr. 1972	(1)

Kahuku (Punamano) Pond(s) (Continued)

2831	HDFG:	12	8 Aug. 1973	(21)
2832	HDFG:	0	15 Jan. 1974	(21)
2833	HDFG:	12	13 Feb. 1974	(21)
2834	HDFG:	3	1-5 Aug. 1974	(1)
2835	HDFG:	2	1 Aug. 1975	(2)
2836	USFWS:	0	Nov. 1975	(13)
2837	USFWS:	7	11 Jan. 1976	(13)
2838	HDFG:	7	15 Jan. 1975	(2)
2839	USFWS:	0	15 Jan. 1976	(13)
2840	HDFG:	2	4-5 Aug. 1976	(2)
2841	USFWS:	0	13 Jan. 1977	(13)
2842	HDFG:	2	13 Jan. 1977	(2)
2843	USFWS:	3	10 June 1977	(13)
2844	USFWS:	0	15 June 1977	(13)
2845	USFWS:	2	22 June 1977	(13)
2846	USFWS:	0	27 July 1977	(13)
2847	USFWS:	16	28 July 1977	(13)
2848	HDFG:	16	27-28 July 1977	(2)

Kahuku (Punamano) Pond(s) (Continued)

2849	USFWS:	11	1 Aug. 1977	(13)
2850	USFWS:	5	27 Aug. 1977	(13)
2851	28	seen	22 Oct. 1977	PYLR78b
2852	USFWS:	0	Nov. 1977	(13)
2853	10	present	7 Jan. 1978	PYLR78c
2854	USFWS:	2	12 Jan. 1978	(13)
2855	HDFG:	2	12-13 Jan. 1978	(2)
2856	USFWS:	2	15 Mar. 1978	(13)
2857	USFWS:	12	11 Apr. 1978	(13)
2858	active nest	found	16 May 1978	COLR78b
2859	HDFG:	0	27, 28, 30 Jul. 1978	(5)
2860	USFWS:	0	Aug. 1978	(13)
2861	USFWS:	0	Oct. 1978	(13)
2862	USFWS:	0	Nov. 1978	(13)
2863	USFWS:	0	11 Dec. 1978	(13)
2864	USFWS:	0	19 Dec. 1978	(13)
2865	USFWS:	0	27 Dec. 1978	(13)
2866	USFWS:	0	Jan. 1979	(13)

Kahuku (Punamano) Pond(s) (Continued)

2867	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2868	USFWS:	1	12 Feb. 1979	(13)
2869	USFWS:	0	Mar. 1979	(13)
2870	HDFG:	1	1,2 Aug. 1979	(5)
2871	HDFG:	0	14, 15, 16 Jan. 1980	(5)
2872	USFWS:	0	Nov. 1980	(13)

Kahuku Airstrip Area

2873	2 seen	9 Feb. 1964	ORDW64a
2874	8 seen	10 Apr. 1966	ANON66b
2875	17 counted	21 Jan. 1967	PYLL67
2876	1 present	13 Oct. 1968	KAIC68d
2877	few in view	10 Nov. 1968	KAIC68b
2878	several seen	18 Feb. 1971	KAIC71d
2879	11 seen	18 Sep. 1971	KAIC71b
2880	HDFG:	12 Apr. 1972	(1)
2881	HDFG:	1-5 Aug. 1974	(1)
2882	HDFG:	15 Jan. 1976	(2)
2883	HDFG:	13 Jan. 1977	(2)
2884	HDFG:	15 Jan. 1979	(5)

2885	HDFG: 5	1,2 Aug. 1979	(5)
Kahuku Aquafarm			
2886	HDFG: 2	15, 16, 20 Jan. 1979	(5)
2887	HDFG: 4	14-16 Jan. 1980	(5)
Kawela Corn Fields			
2888	HDFG: 0	1, 2 Aug. 1979	(5)
Kualoa Pond			
2889	HDFG: 2	24 July 1968	(1)
2890	HDFG: 0	15 Jan. 1973	(1)
2891	HDFG: 2	8 Aug. 1973	(1)
2892	HDFG: 0	15 Jan. 1974	(21)
2893	HDFG: 2	1-5 Aug. 1974	(1)
2894	HDFG: 1	1 Aug. 1975	(2)
2895	HDFG: 4	15 Jan. 1976	(2)
2896	HDFG: 4	4-5 Aug. 1976	(2)
2897	HDFG: 2	27-28 July 1977	(2)
2898	HDFG: 1	12, 13 Jan. 1978	(2)
2899	HDFG: 2	27, 28, 30 July 1978	(5)
2900	HDFG: 1	15, 16, 20 Jan. 1979	(5)
2901	HDFG: 5	1, 2 Aug. 1979	(5)

2902	HDFG:	0	14-16 Jan. 1980	(5)
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Kuilima Sewage Pond

2903	HDFG:	35	1 Aug. 1975	(1)
2904	HDFG:	35	15 Jan. 1976	(2)
2905	HDFG:	3	4-5 Aug. 1976	(2)
2906	HDFG:	2	13 Jan. 1977	(2)
2907	HDFG:	3	27-28 July 1977	(2)
2908	HDFG:	0	12, 13 Jan. 1978	(2)
2909	HDFG:	4	27, 28, 30 July 1978	(5)
2910	USFWS:	13	15 Jan. 1979	(13)
2911	HDFG:	13	15, 16, 20 Jan. 1979	(5)
2912	HDFG:	2	1, 2 Aug. 1979	(5)
2913	HDFG:	6	14-16 Jan. 1980	(5)
2914	HDFG:	8	13 Jan. 1981	(2)

Laie Prawn Farm

2915	HDFG:	0	1, 2 Aug. 1979	(5)
2916	HDFG:	0	14-16 Jan. 1980	(5)

Punahoolapa Pond

2917	HDFG:	overgrown...unsuitable for stilts	1 July 1973 - 30 June 1974	(21)
2918	HDFG:	0	27-28 July 1977	(2)

2919	HDFG:	0	12, 13 Jan. 1978	(2)
2920	HDFG:	4	27, 28, 30 July 1978	(5)
2921	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2922	USFWS:	0	15 Jan. 1979	(13)
2923	HDFG:	0	1, 2 Aug. 1979	(5)
2924	HDFG:	0	14-16 Jan. 1980	(5)

HAUULA

Opaelula Reservoir(s)

2925	HDFG:	0	12 Jan. 1981	(5)
2926	HDFG:	to be included in future censuses due to recent waterbird sightings	(1981)	(5)

Wahiawa Reservoir

2927	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2928	HDFG:	0	1, 2 Aug. 1979	(5)
2929	HDFG:	to be excluded from future censuses due to non-use	(1981)	(5)

KAHANA

Apua Pond (opposite Mokolii)

2930	2 seen	18 Aug. 1971	ANON71b
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Huilua Pond

2931	HDFG:	0	1 Aug. 1975	(2)
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2932	HDFG:	0	15 Jan. 1976	(2)
2933	HDFG:	0	4-5 Aug. 1976	(2)
2934	HDFG:	0	13 Jan. 1977	(2)
2935	HDFG:	0	27-28 July 1977	(2)
2936	HDFG:	0	12, 13 Jan. 1978	(2)
2937	HDFG:	0	15, 16, 20 Jan. 1979	(5)
2938	HDFG:	0	1, 2 Aug. 1979	(5)
2939	HDFG:	0	31 July, 1 Aug. 1980	(5)
2940	HDFG:	0	12 Jan. 1981	(5)
2941	HDFG:	to be excluded from future censuses due to non-use	(July 1981)	(5)
Kahana Stream				
2942	HDFG:	0	4-10 Jan. 1956	(1)
2943	HDFG:	4	7 Aug. 1970	(1)
2944	HDFG:	0	12 Apr. 1972	(1)
Molii Pond				
2945	HDFG:	6	27 July 1971	(1)
2946	HDFG:	2	12 Apr. 1972	(1)
Punaluu Fish Farms				
2947	HDFG:	0	13 Jan. 1977	(2)

WAIPAHI

Aiea - East Loch

2948	8 seen	28 Dec. 1952	ANON53a
2949	4 seen	9 Aug. 1953	ROCR53b
2950	5 seen	6 Sep. 1953	TITM53
2951	3 seen	11 July 1954	ANON54b
2952	7 seen	22 Aug. 1954	PEDB54
2953	6 seen	24 Oct. 1954	HARP54
2954	3 seen	14 Aug. 1955	PYLB55
2955	5 counted	11 Dec. 1955	ROCR56a
2956	0 seen	15 Jan. 1956	KINJ56b
2957	1 seen	25 Aug. 1957	STEE57
2958	3 seen	8 June 1958	SHIE58
2959	0 (dumping and filling have destroyed the old feeding grounds)	10 Aug. 1958	SMAM58
2960	3 seen	27 Sep. 1959	STEE59

Leeward College Taro Field

2961	HDFG: 0	1 Aug. 1975	(2)
2962	HDFG: 0	15 Jan. 1976	(2)

Pearl City Peninsula

2963	HDFG: 19	13-15 Jan. 1970	(1)
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2964	HDFG:	10	27 July 1971	(1)
2965	HDFG:	15	12 Apr. 1972	(1)
2966	HDFG:	15	8 Aug. 1973	(21)
2967	HDFG:	6	29 Oct. 1973	(21)
2968	HDFG:	14	15 Jan. 1974	(21)
2969	HDFG:	136	1-5 Aug. 1974	(1)
2970	HDFG:	23	1 Aug. 1975	(2)
2971	HDFG:	44	15 Jan. 1976	(2)
2972	USFWS:	11 (Riddle area)	5 Dec. 1977	(13)

Pearl City (Waiawa) Unit, Pearl Harbor National Wildlife Refuge

2973	USFWS:	21	Jan. 1976	(13)
2974	USFWS:	12	9 Feb. 1976	(13)
2975	USFWS:	present	3 May 1976	(13)
2976	USFWS:	26	5 May 1976	(13)
2977	USFWS:	17	6 May 1976	(13)
2978	USFWS:	22	7 May 1976	(13)
2979	USFWS:	31	9 May 1976	(13)
2980	USFWS:	37	12 May 1976	(13)
2981	USFWS:	51	13 May 1976	(13)
2982	USFWS:	46	14 May 1976	(13)

2983	USFWS:	39	17 May 1976	(13)
2984	USFWS:	12	19 May 1976	(13)
2985	USFWS:	11	21 May 1976	(13)
2986	USFWS:	21	25 May 1976	(13)
2987	USFWS:	15	26 May 1976	(13)
2988	USFWS:	19	27 May 1976	(13)
2989	USFWS:	19	2 June 1976	(13)
2990	USFWS:	16	3 June 1976	(13)
2991	USFWS:	16	4 June 1976	(13)
2992	USFWS:	13	7 June 1976	(13)
2993	USFWS:	16	8 June 1976	(13)
2994	USFWS:	17	9 June 1976	(13)
2995	USFWS:	14	14 June 1976	(13)
2996	USFWS:	22	15 June 1976	(13)
2997	USFWS:	12	24 June 1976	(13)
2998	USFWS:	52	25 June 1976	(13)
2999	USFWS:	18	1 July 1976	(13)
3000	USFWS:	10	2 July 1976	(13)
3001	USFWS:	21	7 July 1976	(13)
3002	USFWS:	18 (incl. 8 young)	8 July 1976	(13)

3003	USFWS:	16	17 July 1976	(13)
3004	USFWS:	58	21 July 1976	(13)
3005	USFWS:	57	22 July 1976	(13)
3006	USFWS:	59	23 July 1976	(13)
3007	USFWS:	101	2 Aug. 1976	(13)
3008	USFWS:	52	4 Aug. 1976	(13)
3009	USFWS:	111	6 Aug. 1976	(13)
3010	USFWS:	57	10 Aug. 1976	(13)
3011	USFWS:	18	11 Aug. 1976	(13)
3012	USFWS:	10	12 Aug. 1976	(13)
3013	USFWS:	18	13 Aug. 1976	(13)
3014	USFWS:	91	18 Aug. 1976	(13)
3015	USFWS:	43	19 Aug. 1976	(13)
3016	USFWS:	26	20 Aug. 1976	(13)
3017	USFWS:	107	26 Aug. 1976	(13)
3018	USFWS:	92	27 Aug. 1976	(13)
3019	USFWS:	132	1 Sep. 1976	(13)
3020	USFWS:	84	2 Sep. 1976	(13)
3021	USFWS:	52	3 Sep. 1976	(13)
3022	USFWS:	89	7 Sep. 1976	(13)

3023	USFWS:	87	9 Sep. 1976	(13)
3024	USFWS:	247	11 Sep. 1976	(13)
3025	USFWS:	211	15 Sep. 1976	(13)
3026	USFWS:	91	16 Sep. 1976	(13)
3027	USFWS:	137	17 Sep. 1976	(13)
3028	USFWS:	156	18 Sep. 1976	(13)
3029	USFWS:	213	21 Sep. 1976	(13)
3030	USFWS:	141	22 Sep. 1976	(13)
3031	USFWS:	136	23 Sep. 1976	(13)
3032	USFWS:	412	24 Sep. 1976	(13)
3033	USFWS:	193	25 Sep. 1976	(13)
3034	USFWS:	248	30 Sep. 1976	(13)
3035	USFWS:	204	2 Oct. 1976	(13)
3036	USFWS:	154	6 Oct. 1976	(13)
3037	USFWS:	187	7 Oct. 1976	(13)
3038	USFWS:	205	8 Oct. 1976	(13)
3039	USFWS:	202	9 Oct. 1976	(13)
3040	USFWS:	328	13 Oct. 1976	(13)
3041	USFWS:	368	14 Oct. 1976	(13)
3042	USFWS:	262	15 Oct. 1976	(13)

3043	USFWS:	454	16 Oct. 1976	(13)
3044	USFWS:	332	17 Oct. 1976	(13)
3045	USFWS:	55	22 Oct. 1976	(13)
3046	USFWS:	230	23 Oct. 1976	(13)
3047	435 seen		25 Oct. 1976	PYLR77
3048	USFWS:	79	29 Oct. 1976	(13)
3049	USFWS:	55	30 Oct. 1976	(13)
3050	USFWS:	134	1 Nov. 1976	(13)
3051	USFWS:	27	4 Nov. 1976	(13)
3052	USFWS:	26	5 Nov. 1976	(13)
3053	USFWS:	79	11 Nov. 1976	(13)
3054	USFWS:	77	12 Nov. 1976	(13)
3055	USFWS:	260	13 Nov. 1976	(13)
3056	USFWS:	55	18 Nov. 1976	(13)
3057	USFWS:	48	19 Nov. 1976	(13)
3058	USFWS:	47	22 Nov. 1976	(13)
3059	USFWS:	59	30 Nov. 1976	(13)
3060	USFWS:	65	2 Dec. 1976	(13)
3061	USFWS:	59	7 Dec. 1976	(13)
3062	USFWS:	64	11 Dec. 1976	(13)

3063	USFWS:	46	13 Dec. 1976	(13)
3064	USFWS:	51	14 Dec. 1976	(13)
3065	USFWS:	42	10 Jan. 1976	(13)
3066	HDFG:	63	13 Jan. 1977	(13)
3067	USFWS:	8	31 Jan. 1977	(13)
3068	USFWS:	15	23 Feb. 1977	(13)
3069	USFWS:	8	10 Mar. 1977	(13)
3070	USFWS:	26	14 Mar. 1977	(13)
3071	USFWS:	59	11 Apr. 1977	(13)
3072	USFWS:	72	12 Apr. 1977	(13)
3073	USFWS:	68	14 Apr. 1977	(13)
3074	USFWS:	84	15 Apr. 1977	(13)
3075	USFWS:	112	18 Apr. 1977	(13)
3076	USFWS:	82	19 Apr. 1977	(13)
3077	USFWS:	59	22 Apr. 1977	(13)
3078	USFWS:	78	26 Apr. 1977	(13)
3079	USFWS:	102	28 Apr. 1977	(13)
3080	USFWS:	79	29 Apr. 1977	(13)
3081	USFWS:	97	5 May 1977	(13)
3082	USFWS:	156	8 May 1977	(13)

3083	USFWS:	192	12 May 1977	(13)
3084	USFWS:	104	16 May 1977	(13)
3085	USFWS:	119	19 May 1977	(13)
3086	USFWS:	115	20 May 1977	(13)
3087	USFWS:	113	23 May 1977	(13)
3088	USFWS:	122	27 May 1977	(13)
3089	USFWS:	116	31 May 1977	(13)
3090	USFWS:	142	2 June 1977	(13)
3091	USFWS:	142	3 June 1977	(13)
3092	USFWS:	126	6 June 1977	(13)
3093	USFWS:	221	10 June 1977	(13)
3094	USFWS:	110	15 June 1977	(13)
3095	USFWS:	57	17 June 1977	(13)
3096	USFWS:	66	20 June 1977	(13)
3097	USFWS:	96	24 June 1977	(13)
3098	USFWS:	102	30 June 1977	(13)
3099	USFWS:	29	1 July 1977	(13)
3100	USFWS:	84	12 July 1977	(13)
3101	USFWS:	250	14 July 1977	(13)
3102	USFWS:	239	18 July 1977	(13)

Pearl City (Waiawa) Unit (Continued)

3103	USFWS:	160	25 July 1977	(13)
3104	USFWS:	155	27 July 1977	(13)
3105	USFWS:	203	28 July 1977	(13)
3106	USFWS:	253	3 Aug. 1977	(13)
3107	USFWS:	254	8 Aug. 1977	(13)
3108	USFWS:	184	9 Aug. 1977	(13)
3109	USFWS:	69	19 Aug. 1977	(13)
3110	USFWS:	9	24 Aug. 1977	(13)
3111	USFWS:	44	27 Aug. 1977	(13)
3112	USFWS:	99	4 Oct. 1977	(13)
3113	USFWS:	64	5 Oct. 1977	(13)
3114	USFWS:	82	6 Oct. 1977	(13)
3115	UFSWS:	139	7 Oct. 1977	(13)
3116	USFWS:	81	8 Oct. 1977	(13)
3117	USFWS:	126	11 Oct. 1977	(13)
3118	USFWS:	190	12 Oct. 1977	(13)
3119	USFWS:	143	14 Oct. 1977	(13)
3120	USFWS:	167	17 Oct. 1977	(13)
3121	USFWS:	176	18 Oct. 1977	(13)

3122	USFWS:	210	19 Oct. 1977	(13)
3123	USFWS:	116	26 Oct. 1977	(13)
3124	USFWS:	197	31 Oct. 1977	(13)
3125	USFWS:	99	2 Nov. 1977	(13)
3126	USFWS:	93	4 Nov. 1977	(13)
3127	USFWS:	109	10 Nov. 1977	(13)
3128	USFWS:	101	11 Nov. 1977	(13)
3129	USFWS:	94	15 Nov. 1977	(13)
3130	USFWS:	83	16 Nov. 1977	(13)
3131	USFWS:	91	21 Nov. 1977	(13)
3132	USFWS:	109	25 Nov. 1977	(13)
3133	USFWS:	120	30 Nov. 1977	(13)
3134	USFWS:	189	2 Dec. 1977	(13)
3135	USFWS:	159	5 Dec. 1977	(13)
3136	USFWS:	84	17 Dec. 1977	(13)
3137	Shallenberger: more than 70 were counted on the settling basins and sewage oxidation ponds...less than a dozen in the Pouhala Marsh area...1 June and 27 Aug. surveys		(1977)	(3)
3138	USFWS:	58	27 Dec. 1977	(13)
3139	USFWS;	49	5 Jan. 1977	(13)
3140	USFWS:	32	12 Jan. 1978	(13)

3141	USFWS:	25	27 Jan. 1978	(13)
3142	USFWS:	63	31 Jan. 1978	(13)
3143	USFWS:	37	8 Feb. 1978	(13)
3144	USFWS:	54	13 Feb. 1978	(13)
3145	USFWS:	86	14 Feb. 1978	(13)
3146	USFWS:	65	15 Feb. 1978	(13)
3147	USFWS:	79	16 Feb. 1978	(13)
3148	USFWS:	126	17 Feb. 1978	(13)
3149	USFWS:	103	20 Feb. 1978	(13)
3150	USFWS:	90	21 Feb. 1978	(13)
3151	USFWS:	126	22 Feb. 1978	(13)
3152	USFWS:	126	23 Feb. 1978	(13)
3153	USFWS:	94	24 Feb. 1978	(13)
3154	USFWS:	119	25 Feb. 1978	(13)
3155	USFWS:	98	26 Feb. 1978	(13)
3156	USFWS:	88	27 Feb. 1978	(13)
3157	USFWS:	86	28 Feb. 1978	(13)
3158	USFWS:	70	1 Mar. 1978	(13)
3159	USFWS:	69	2 Mar. 1978	(13)
3160	USFWS:	8	3 Mar. 1978	(13)

3161	USFWS:	94	6 Mar. 1978	(13)
3162	USFWS:	84	7 Mar. 1978	(13)
3163	USFWS:	56	8 Mar. 1978	(13)
3164	USFWS:	69	9 Mar. 1978	(13)
3165	USFWS:	103	10 Mar. 1978	(13)
3166	USFWS:	52	13 Mar. 1978	(13)
3167	USFWS:	71	14 Mar. 1978	(13)
3168	USFWS:	71	15 Mar. 1978	(13)
3169	USFWS:	60	17 Mar. 1978	(13)
3170	USFWS:	63	18 Mar. 1978	(13)
3171	USFWS:	90	20 Mar. 1978	(13)
3172	USFWS:	92	21 Mar. 1978	(13)
3173	USFWS:	92	22 Mar. 1978	(13)
3174	USFWS:	75	30 Mar. 1978	(13)
3175	USFWS:	60	31 Mar. 1978	(13)
3176	USFWS:	75	1 Apr. 1978	(13)
3177	USFWS:	75	2 Apr. 1978	(13)
3178	USFWS:	72	3 Apr. 1978	(13)
3179	USFWS:	81	4 Apr. 1978	(13)
3180	USFWS:	99	5 Apr. 1978	(13)

3181	USFWS:	101	7 Apr. 1978	(13)
3182	USFWS:	105	8 Apr. 1978	(13)
3183	USFWS:	86	11 Apr. 1978	(13)
3184	USFWS:	71	12 Apr. 1978	(13)
3185	USFWS:	104	13 Apr. 1978	(13)
3186	USFWS:	106	18 Apr. 1978	(13)
3187	USFWS:	80	19 Apr. 1978	(13)
3188	USFWS:	66	21 Apr. 1978	(13)
3189	USFWS:	54 incl. 1 chick	28 Apr. 1978	(13)
3190	USFWS:	50	1 May 1978	(13)
3191	USFWS:	59	2 May 1978	(13)
3192	USFWS:	81	8 May 1978	(13)
3193	USFWS:	54	9 May 1978	(13)
3194	USFWS:	87	10 May 1978	(13)
3195	USFWS:	98	17 May 1978	(13)
3196	USFWS:	120	18 May 1978	(13)
3197	USFWS:	93	23 May 1978	(13)
3198	USFWS:	57	25 May 1978	(13)
3199	USFWS:	66	30 May 1978	(13)
3200	USFWS:	51 incl. 2 young	31 May 1978	(13)

3201	USFWS:	56 incl. 2 young	6 June 1978	(13)
3202	USFWS:	44	12 June 1978	(13)
3203	USFWS:	55 incl. 4 young	13 June 1978	(13)
3204	USFWS:	84	15 June 1978	(13)
3205	USFWS:	163 incl. 2 young	17 June 1978	(13)
3206	USFWS:	175 incl. 1 young	18 June 1978	(13)
3207	USFWS:	127	19 June 1978	(13)
3208	USFWS:	35	21 June 1978	(13)
3209	USFWS:	52 incl. 6 young	22 June 1978	(13)
3210	USFWS:	34	27 June 1978	(13)
3211	USFWS:	39	1 July 1978	(13)
3212	USFWS:	48	2 July 1978	(13)
3213	USFWS:	34 incl. 8 young	6 July 1978	(13)
3214	USFWS:	35	7 July 1978	(13)
3215	USFWS:	28	9 July 1978	(13)
3216	USFWS:	43	12 July 1978	(13)
3217	USFWS:	29	13 July 1978	(13)
3218	USFWS:	41	15 July 1978	(13)
3219	USFWS:	34	16 July 1978	(13)
3220	USFWS:	35	21 July 1978	(13)

3221	USFWS:	22	22 July 1978	(13)
3222	USFWS:	28	23 July 1978	(13)
3223	USFWS:	26	24 July 1978	(13)
3224	USFWS:	31 incl. 5 young	26 July 1978	(13)
3225	USFWS:	30	27 July 1978	(13)
3226	USFWS:	17	28 July 1978	(13)
3227	USFWS:	14	29 July 1978	(13)
3228	USFWS:	17	30 July 1978	(13)
3229	USFWS:	21	31 July 1978	(13)
3230	USFWS:	22	3 Aug. 1978	(13)
3231	USFWS:	22 incl. 1 young	4 Aug. 1978	(13)
3232	USFWS:	19 incl. 1 young	7 Aug. 1978	(13)
3233	USFWS:	19	8 Aug. 1978	(13)
3234	USFWS:	14	11 Aug. 1978	(13)
3235	USFWS:	14	12 Aug. 1978	(13)
3236	USFWS:	10	14 Aug. 1978	(13)
3237	USFWS:	11	15 Aug. 1978	(13)
3238	USFWS:	7	17 Aug. 1978	(13)
3239	USFWS:	16	18 Aug. 1978	(13)
3240	USFWS:	29	21 Aug. 1978	(13)

3241	USFWS:	8	6 Sep. 1978	(13)
3242	USFWS:	28	9 Sep. 1978	(13)
3243	USFWS:	39	10 Sep. 1978	(13)
3244	USFWS:	67	15 Sep. 1978	(13)
3245	USFWS:	81	18 Sep. 1978	(13)
3246	USFWS:	49	1 Oct. 1978	(13)
3247	USFWS:	57	7 Oct. 1978	(13)
3248	USFWS:	49	8 Oct. 1978	(13)
3249	USFWS:	56	14 Oct. 1978	(13)
3250	USFWS:	94	15 Oct. 1978	(13)
3251	USFWS:	105	22 Oct. 1978	(13)
3252	USFWS:	62	26 Oct. 1978	(13)
3253	USFWS:	74	29 Oct. 1978	(13)
3254	USFWS:	20	1 Nov. 1978	(13)
3255	USFWS:	8	2 Nov. 1978	(13)
3256	USFWS:	20	4 Nov. 1978	(13)
3257	USFWS:	21	6 Nov. 1978	(13)
3258	USFWS:	36	7 Nov. 1978	(13)
3259	USFWS:	26	8 Nov. 1978	(13)
3260	USFWS:	40	10 Nov. 1978	(13)

3261	USFWS:	25	14 Nov. 1978	(13)
3262	USFWS:	34	15 Nov. 1978	(13)
3263	USFWS:	42	16 Nov. 1978	(13)
3264	USFWS:	18	27 Nov. 1978	(13)
3265	USFWS:	18	30 Nov. 1978	(13)
3266	USFWS:	15	1 Dec. 1978	(13)
3267	USFWS:	40	5 Dec. 1978	(13)
3268	USFWS:	37	6 Dec. 1978	(13)
3269	USFWS:	31	9 Dec. 1978	(13)
3270	USFWS:	16	11 Dec. 1978	(13)
3271	USFWS:	10	12 Dec. 1978	(13)
3272	USFWS:	7	13 Dec. 1978	(13)
3273	USFWS:	8	14 Dec. 1978	(13)
3274	USFWS:	12	15 Dec. 1978	(13)
3275	USFWS:	7	16 Dec. 1978	(13)
3276	USFWS:	7	18 Dec. 1978	(13)
3277	USFWS:	7	19 Dec. 1978	(13)
3278	USFWS:	6	20 Dec. 1978	(13)
3279	USFWS:	6	21 Dec. 1978	(13)
3280	USFWS:	10	22 Dec. 1978	(13)

3281	USFWS:	8	27 Dec. 1978	(13)
3282	USFWS:	26	29 Dec. 1978	(13)
3283	USFWS:	6	30 Dec. 1978	(13)
3284	USFWS:	9	2 Jan. 1979	(13)
3285	USFWS:	10	3 Jan. 1979	(13)
3286	USFWS:	14	5 Jan. 1979	(13)
3287	USFWS:	9	8 Jan. 1979	(13)
3288	USFWS:	14	9 Jan. 1979	(13)
3289	USFWS:	12	10 Jan. 1979	(13)
3290	USFWS:	16	11 Jan. 1979	(13)
3291	USFWS:	7	12 Jan. 1979	(13)
3292	USFWS:	0	15 Jan. 1979	(13)
3293	USFWS:	0	16 Jan. 1979	(13)
3294	USFWS:	0	18 Jan. 1979	(13)
3295	USFWS:	0	22 Jan. 1979	(13)
3296	USFWS:	1	23 Jan. 1979	(13)
3297	USFWS:	8	24 Jan. 1979	(13)
3298	USFWS:	1	25 Jan. 1979	(13)
3299	USFWS:	0	30 Jan. 1979	(13)
3300	USFWS:	7	2 Feb. 1979	(13)

3301	USFWS:	7	5 Feb. 1979	(13)
3302	USFWS:	10	6 Feb. 1979	(13)
3303	USFWS:	7	9 Feb. 1979	(13)
3304	USFWS:	8	12 Feb. 1979	(13)
3305	USFWS:	0	13 Feb. 1979	(13)
3306	USFWS:	4	14 Feb. 1979	(13)
3307	USFWS:	7	15 Feb. 1979	(13)
3308	USFWS:	9	19 Feb. 1979	(13)
3309	USFWS:	5	21 Feb. 1979	(13)
3310	USFWS:	7	22 Feb. 1979	(13)
3311	USFWS:	9	27 Feb. 1979	(13)
3312	USFWS:	6	3 Mar. 1979	(13)
3313	USFWS:	8	5 Mar. 1979	(13)
3314	USFWS:	6	6 Mar. 1979	(13)
3315	USFWS:	8	9 Mar. 1979	(13)
3316	USFWS:	6	15 Mar. 1979	(13)
3317	USFWS:	8	28 Mar. 1979	(13)
3318	HDFG:	135	1,2 Aug. 1979	(5)
3319	USFWS:	6	25 Sep. 1979	(13)
3320	USFWS:	8	27 Oct. 1979	(13)

3321	USFWS:	12	8 Nov. 1979	(13)
3322	USFWS:	12	20 Dec. 1979	(13)
3323	USFWS:	4	11 Jan. 1980	(13)
3324	HDFG:	17	14, 15, 16 Jan. 1980	(5)
3325	USFWS:	8	22 Jan. 1980	(13)
3325a	Coleman: mean breeding population of 40 censused		1978-1980	(51)
Sumida Watercress Farm, Waiiau				
3326	3 seen...on new taro bed		13 Sep. 1964	ORDW64c
3327	several seen		11 Sep. 1966	ORDW66a
3328	HDFG:	0	1 Aug. 1975	(2)
3329	HDFG:	0	15 Jan. 1976	(2)
3330	HDFG:	0	4, 5 Aug. 1976	(2)
Ted Makalena Golf Course				
3331	HDFG:	0	1 Aug. 1975	(1)
3332	HDFG:	0	15 Jan. 1976	(2)
Waimalu				
3333	HDFG:	3	13,14 Jan. 1966	(1)
Waipio - Leeward Golf Course				
3334	1 seen		8 Nov. 1970	MULW71

KANEOHE

Heeieia - Meadows - Marsh - Wetlands - Fish Pond

3335	HDFG:	0	12 Apr. 1972	(1)
3336	HDFG:	0	15 Jan. 1976	(2)
3337	HDFG:	0	4-5 Aug. 1976	(2)
3338	HDFG:	0	12, 13 Jan. 1977	(2)
3339	HDFG:	0	27, 28, 30 July 1978	(5)
3340	HDFG:	0	15, 16, 20 Jan. 1979	(5)
3341	HDFG:	0	1, 2 Aug. 1979	(5)
3342	HDFG:	0	14-16 Jan. 1980	(5)

Kahaluu Pond

3343	HDFG:	4	13-15 Jan. 1970	(1)
3344	HDFG:	6	7 Aug. 1970	(1)
3345	HDFG:	0	12 Apr. 1972	(1)
3346	HDFG:	0	4, 5 Aug. 1976	(2)

MOKAPU

Kaelepulu Pond (now Enchanted Lake subdivision)

3347	Northwood:	perhaps 200	29 Apr. 1934	(20)
3348	Northwood:	3 nests found	13 May 1934	(20)
3349	Northwood:	perhaps 100	14 Apr. 1935	(20)

3350	Northwood: found several nests	19 May 1935	(20)
3351	Northwood: seen	1 July 1935	(20)
3352	Shallenberger: last recorded nesting	1935	(3)
3353	Northwood: only 5	4 July 1937	(20)
3354	Northwood: plenty	18 July 1937	(20)
3355	counted over 75	31 July (1935-1937)	MUNG46
3356	Northwood: 0	16 Jan. 1938	(20)
3357	Northwood: 0	3 July 1938	(20)
3358	Northwood: 0	13 Nov. 1938	(20)
3359	Northwood: 0	30 Apr. 1939	(20)
3360	Northwood: 0	4 July 1939	(20)
3361	Northwood: 0	26 May 1940	(20)
3362	300 estimated, Christmas Count	17 Dec. 1944	MUNG45
3363	perhaps 200, Christmas Count	23 Dec. 1945	PETR46
3364	100+	13 Oct. 1946	ANON46
3365	4 counted	4 Jan. 1947	DONW47b
3366	4, Christmas Count	26 Dec. 1948	ROCR49
3367	43 seen	4 Feb. 1951	HATG51b
3368	150 estimated	14 Oct. 1951	HOSC51
3369	6, Christmas Count	28 Dec. 1952	ANON53a

3370	nest found	3 May 1953	HATG53b
3371	1 seen (Pond mostly dry)	6 Sep. 1953	TITM53
3372	1, Christmas Count	26 Dec. 1953	ANON54a
3373	3, Christmas Count	26 Dec. 1954	ANON55
3374	quite a few	24 Apr. 1955	POLC55
3375	HDFG: 0	4-10 Jan. 1956	(1)
3376	5 nests found	30 Mar. 1957	HANC57a
3377	24 (Pond practically dry)	28 Apr. 1957	ROCR57b
3378	HDFG: 198	14-17 Jan. 1958	(1)
3379	in considerable numbers	23 Mar.-14 Apr. 1958	EASW58
3380	present	25 Jan. 1959	MACM59
3381	seen	23 Feb. 1959	HANC59a
3382	3 seen (Pond being filled with dirt for housing)	11 Sep. 1960	ANON60c
3383	HDFG: 16	10-13 Jan. 1961	(1)
3384	0 reported	20 Aug. 1961	ORDW61
3385	50+ seen	14 Oct. 1961	ORDW62a
3386	2 (Pond being lowered 8 feet)	31 Dec. 1961	ANON62
3387	HDFG: 2	15-17 Jan. 1962	(1)
3388	42, Christmas Count	23 Dec. 1962	ANON63a
3389	HDFG: 37	14-18 Jan. 1963	(1)

3390	2, Christmas Count	29 Dec. 1963	ANON64
3391	HDFG: 6	15 Jan. 1964	(1)
3392	USFWS: 2	30 Aug. 1964	(12)
3393	27, Christmas Count	27 Dec. 1964	ANON65a
3394	HDFG: 18	14 Jan. 1965	(1)
3395	20 counted	16-17 Jul. 1965	DONW65b
3396	21 reported	26 Nov. 1965	DONW66b
3397	16, Christmas Count	2 Jan. 1966	ANON66a
3398	HDFG: 15	13-14 Jan. 1966	(1)
3399	USFWS: 5	23 Oct. 1966	(18)
3400	31, Christmas Count	26 Dec. 1966	ANON67a
3401	USFWS: 15-20 reported during summer, 5-10 during winter; breeding not verified	(1966)	(11)
3402	HDFG: 9	13-16 Jan. 1967	(1)
3403	28, Christmas Count	31 Dec. 1967	ANON68
3404	HDFG: 23	8-10 Jan. 1968	(1)
3405	HDFG: 10	24 July 1968	(1)
3406	HDFG: 13	13-15 Jan. 1970	(1)
3407	HDFG: 5	24 July 1969	(1)
3408	HDFG: 8	13-15 Jan. 1970	(1)
3409	HDFG: 8	27 July 1971	(1)

3410	HDFG:	0	12 Apr. 1972	(1)
3411	HDFG:	4	8 Aug. 1973	(1)
3412	HDFG:	4	15 Jan. 1974	(1)
3413	HDFG:	0	19 Feb. 1974	(1)
3414	HDFG:	2	1-5 Aug. 1974	(1)
3415	HDFG:	0	1 Aug. 1975	(2)
3416	DHFG:	2	15 Feb. 1976	(2)
3417	HDFG:	0	4-5 Aug. 1976	(2)
3418	HDFG:	0	13 Jan. 1977	(2)
3419	HDFG:	2	27-28 July 1977	(2)
3420	Shallenberger:	observed 3-11 on 3 June, 15 July, 24 Aug.	1977	(3)
3421	HDFG:	0	12-13 Jan. 1978	(2)
3422	HDFG:	0	27, 28 30 July 1978	(5)
3423	HDFG:	3	15, 16, 20 Jan. 1979	(5)
3424	HDFG:	0	1, 2 Aug. 1979	(5)
Kaelepulu Flood Control				
3425	HDFG:	0	27-28 July 1977	(2)
3426	HDFG:	0	12-13 Jan. 1978	(2)
3427	HDFG:	0	15, 16, 20 Jan. 1979	(5)
3428	HDFG:	3	1, 2 Aug. 1979	(5)

Kailua

3429	5 groups flying over...going from KMCAS to Kaelepulu	(1 Sep.) 1953	ANON53c
Kaneohe Marine Corps Air Station - Mokapu Peninsula			
3430	Northwood: 0	20 Nov. 1938	(20)
3431	Northwood: 12	18 Feb. 1940	(20)
3432	Northwood: 6	27 Oct. 1940	(20)
3433	85 or more	4 Jan. 1947	DONW47b
3434	526 counted...400+ estimated	19 Apr. 1947	DONW47a
3435	seen flying about	9 Nov. 1947	HAMI47
3436	observed	28 Nov. 1947	HATG48a
3437	127, Christmas Count	21 Dec. 1947	HATG48c
3438	141 counted	4 Jan. 1948	WOOD48
3439	several seen	13 Mar. 1948	PEDB48
3440	128, Christmas Count	26 Dec. 1948	PORR49
3441	52 seen	13 Nov. 1949	PECA50
3442	41, Christmas Count	26 Dec. 1949	HATG50b
3443	24 counted	22 Jan. 1950	PORM50
3444	37+ present	8 July 1950	HATG50a
3445	several seen	29 July 1950	HOSC50
3446	11, Christmas Count	31 Dec. 1950	HATG51a

3447	75 counted	14 Oct. 1951	HOSC51
3448	66, Christmas Count	31 Dec. 1951	ANON52a
3449	2 reported seen	9 Mar. 1952	TITM52a
3450	2 counted	19 Mar. 1952	ANON52b
3451	5 seen	9 Nov. 1952	HATG52
3452	25, Christmas Count	28 Dec. 1952	ANON53a
3453	seen	18 Jan. 1953	ANON53b
3454	24 seen	22 Feb. 1953	ROCR53a
3455	18 seen	22 Nov. 1953	HATG54
3456	28, Christmas Count	26 Dec. 1953	ANON54a
3457	ca. 30	24 July 1954	PYLR54
3458	a dozen	10 Oct. 1954	GOSG54b
3459	9, Christmas Count	26 Dec. 1954	ANON55
3460	0 seen	20 Mar. 1955	LABA55a
3461	68 counted	23 May 1955	PYLR55
3462	24, Christmas Count	26 Dec. 1955	ANON56a
3463	HDFG: 2	4-10 Jan. 1956	(1)
3464	42, Christmas Count	23 Dec. 1956	HATG57
3465	14 counted	14 July 1957	PEDB57

3466	several seen	24 Nov. 1957	CLAH58
3467	considerable numbers	23 Mar. 1958	EASW58
3468	9, perhaps more	3 Aug. 1958	PYLR58
3469	27, Christmas Count	21 Dec. 1958	ANON59
3470	seen	23 Feb. 1959	HANC59a
3471	13, Christmas count	27 Dec. 1959	ANON60a
3472	1 seen	31 July 1960	PEDB60
3473	21, Christmas Count	26 Dec. 1960	ANON61a
3474	HDFG: 34	10-13 Jan. 1961	(1)
3475	94, Christmas Count	31 Dec. 1961	ANON62
3476	HDFG: 19	15-17 Jan. 1962	(1)
3477	averaged 60-70 over the past months	(June 1962)	ORDW62b
3478	37, Christmas Count	23 Dec. 1962	ANON63a
3479	HDFG: 32	14-18 Jan. 1963	(1)
3480	45, Christmas Count	29 Dec. 1963	ANON64
3481	HDFG: 99	15 Jan. 1964	(1)
3482	nest found	3 May 1964	BERA67
3483	2 nests found	3, 24 May 1964	ORDW64b
3484	USFWS: 35	30 Aug. 1964	(12)
3485	18, Christmas Count	27 Dec. 1964	ANON65a

3486	HDFG: 73	14 Jan. 1965	(1)
3487	ca. 3 dozen	10 Oct. 1965	FRIC66
3488	25 counted	23 Nov. 1965	DONW66b
3489	41 reported	26 Nov. 1965	DONW66b
3490	USFWS: 41 seen	26 Nov. 1965	(12)
3491	HDFG: moderately to heavily used; evidence of breeding found	2 Jan. 1966	ANON66a
3492	39, Christmas Count	2 Jan. 1966	ANON66a
3493	HDFG: 72	13-14 Jan. 1966	(1)
3494	Banko: 1 nest found	22 Apr. 1966	(18)
3495	103, Christmas Count	26 Dec. 1966	ANON67a
3496	1 few seen	26 Dec. 1966	ORDW67
3497	USFWS: moderately to heavily utilized; moderate to abundant nesting	1966	(11)
3498	HDFG: 33	13-16 Jan. 1967	(1)
3499	52, Christmas Count	31 Dec. 1967	ANON68
3500	1 seen	1 Jan. 1968	ORER68
3501	HDFG: 74	8-10 Jan. 1968	(1)
3502	6 seen	21 Apr. 1968	GAUJ68b
3503	12 counted	24 Oct. 1968	DONW69a
3504	24, Christmas Count	29 Dec. 1968	ANON69a

3505	HDFG: 51	13-14 Jan. 1969	(1)
3506	present	13 Apr. 1969	KAIH69
3507	39, Christmas Count	28 Dec. 1969	ANON70b
3508	HDFG: 10	13-15 Jan. 1970	(1)
3509	ca. 40	12 Apr. 1970	KAIC70c
3510	HDFG: 51	7 Aug. 1970	(1)
3511	36, Christmas Count	27 Dec. 1970	MULW71f
3512	10 seen	12 Jan. 1971	OLSD71b
3513	8 counted	18 Apr. 1971	KAIC71a
3514	HDFG: 27	27 July 1971	(1)
3515	72, Christmas Count	26 Dec. 1971	MULW72a
3516	HDFG: 48	12 Apr. 1972	(1)
3517	54, Christmas Count	17 Dec. 1972	MULW73a
3518	6 observed	8 Apr. 1973	DUNF73
3519	HDFG: 52	8 Aug. 1973	(1)
3520	HDFG: 59	15 Jan. 1974	(1)
3521	HDFG: 65	4 Feb. 1974	(1)
3522	saw 4-5 and a few young	10 Mar. 1974	WILE74a
3523	HDFG: 39	15 May 1974	(21)
3524	HDFG: 65	1-5 Aug. 1974	(1)

3525	HDFG: 52	8 Aug. 1974	(1)
3526	24 at least	10 Nov. 1974	WILE75c
3527	81, Christmas Count	22 Dec. 1974	WILE75d
3528	HDFG: 7 nests found	(1974)	(9)
3529	present	17 Feb. 1975	WILE75e
3530	30 seen	13 Apr. 1975	WILE75f
3531	HDFG: 0 nests found	22 Apr. 1975	(21)
3532	HDFG: 0 nests found	30 Apr. 1975	(21)
3533	HDFG: 1-egg nest found	1 May 1975	(21)
3534	HDFG: 2 4-egg nests found	14 May 1975	(21)
3535	HDFG: 2 1-egg nests found	16 May 1975	(21)
3536	HDFG: 2 4-egg nests found; 1-egg nest located 1 May found destroyed	19 June 1975	(21)
3537	HDFG: 56	1 Aug. 1975	(2)
3538	HDFG: 62	15 Jan. 1976	(2)
3539	HDFG: 89	4-5 Aug. 1976	(2)
3540	HDFG: 81	13 Jan. 1977	(2)
3541	HDFG: 53	22 Oct. 1977	PYLR78b
3542	HDFG: only 56 found (vs. 116 in 1980)...possible reasons fo decline include (1) troop activity on Kailua Bay side of the Ponds, (2) reduction of open habitat due to batis growth, (3) early departure of breeding age birds which nest elsewhere	(?) 1981	(5)

Nuupia Pond(s)
(Kaneohe Marine Corps Air Station)

3543	several seen	9 Nov. 1947	HAMI47
3544	3 seen	18 Aug. 1949	HARP49
3545	100+ seen	11 Apr. 1953	BARD53
3546	Banko: 4 censused	20 Apr. 1966	(18)
3547	Banko: 0 nests found	22 Apr. 1966	(18)
3548	HDFG: 18	24 July 1968	(1)
3549	HDFG: 26	24 July 1969	(1)
3550	4, 2 1-2 week-old chicks seen with 2 sets parents	10 Mar. 1974	SHAR74a
3551	pair seen near 4-egg nest (? 2nd nest), less than 15 feet from where 4 chicks found 10 March	6 May 1974	SHAR74a
3552	HDFG: 39	15 May 1974	(21)
3553	HDFG: 1 nest found	18 May 1974	(1)
3554	HDFG: 0	21 May 1974	(1)
3555	4, 4, 3, 4, and 4 eggs found in 5 nests	27 May 1974	(21)
3556	HDFG: 22	27 May 1974	(1)
3557	HDFG: 11 nests found	3 June 1974	(1)
3558	HDFG: 4 eggs found	3 June 1974	(21)
3559	HDFG: 30 censused and 2 nests found	25 June 1974	(1)
3560	HDFG: 4 nests found	1975	(9)

3561	HDFG: 35 nests found on weekly searches...13 with eggs...11 destroyed...2 successful	Feb.-June 1976	(19)
3561a	HDFG: 69 nests found on weekly searches...24.7 hatched, 56,7 destroyed by predators, 15.5 unsuccessful due to flooding	2 Feb.-19 July 1977	(16)
3562	HDFG: 67	27, 28 July 1977	(2)
3563	HDFG: 36 nests found...7 successful...20 lost to predators...8 flooded...1 abandoned	1977	(9)
3564	HDFG: 25 nests...range of definite and probable completed clutch sizes: 3-4 (3.9 mean, 0.3 standard deviation)	1977	(9)
3565	HDFG: 54	12, 13 Jan. 1978	(2)
3566	HDFG: 88	27, 28 30 July 1978	(5)
3567	HDFG: nesting probably started in early April and extended through July...based on 23 nests the average complete clutch was found to be 4 eggs...38% hatching success based on 24 nests containing 86 eggs and was significantly higher than in 1977 due to less predation ...predation and flooding accounted for over 70% of egg losses	20 Apr.-17 Aug. 1978	(43)
3568	HDFG: 23 nests...range of definite and probable completed clutch sizes: 0 (4.0 mean, standard deviation = 0)	1978	(9)
3569	HDFG: 24 nests...9 successful...5 lost to predation, 5 flooded, 3 abandoned...2 to human disturbance	1978	(9)
3570	HDFG: 99	15, 16, 20 Jan. 1979	(5)
3571	present	11 Feb. 1979	PYLR79b

3572	seen	28 Apr. 1979	LARR79
3573	HDFG: 115	1, 2 Aug. 1979	(5)
3574	HDFG: 32 nests found...48% nesting success...4 eggs in ave. complete clutch...ca. 1 young/nest produced (based on sightings of fledglings or older juveniles) ...predation accounted for nearly 80% of nest losses, nest flooding not a factor as in previous years	1979	(9)
3575	HDFG: 23 nests...range of definite and probable completed clutch sizes: 3-4 (3.9 mean, 0.3 standard deviation)	1979	(9)
3576	HDFG: 27 nests...13 successful...(11) lost to predation, (3) to human disturbance	(3)	(9)
3577	HDFG: 104	14, 15, 16 Jan. 1980	(5)
3577a	Coleman: mean breeding population of 60 censused	1978-1980	(51)
3578	HDFG: 21 eggs salvaged on Oahu (+2 on Kauai) resulted in 16 hatchlings reared at Honolulu Zoo...first record of captive rearing of Hawaiian Stilt...once disease screening is complete 6 will be returned to wild... great potential exists for the captive propagation and release of these birds as one way of increasing the size of the wild population...consultations with Honolulu Zoo and USFWS personnel will continued to explore this potential	1 July 1979 - 30 June 1980	(44)
3579	HDFG: 51 possible nests monitored...29 became active with eggs; 17 hatched at least 1 chick, 5 were predated, 3 flooded and 1 failed due to heavy rain...ave. size of 20 known sized nests was 3.8, hatching success 2.4 chicks per clutch or 64%	17 Mar.-30 July 1981	(47)
3580	HDFG: 10	12, 13, Jan. 1978	(2)
3581	HDFG: 5	27, 28, 30 July 1978	(5)

3582	HDFG: 0	1, 2 Aug. 1979	(5)
3583	HDFG: 12	14, 15, 16 Jan. 1980	(5)
Kaluapuhi Pond (Kaneohe Marine Corps Air Station)			
3584	Banko: 4 censused; found two 4-eggs nests, 3 nest "scrapes"	20 Apr. 1966	(18)
3585	Banko: 18 counted; one 1-egg nest and 2 "scrapes" found	22 Apr. 1966	(18)
3586	small flock + others seen	5 June 1966	DONW67a
3587	Banko: 29 counted; 1 old nest with 1 egg, 1 old "scrape", no young seen, area very dry	1 July 1966	(18)
3588	HDFG: 14	24 July 1968	(1)
3589	HDFG: 4	24 July 1968f	(1)
3590	at least 18 seen	4 July 1974	ANON74a
3591	a few present	11 Feb. 1979	PYLR79b
3592	seen	28 Apr. 1979	LARR79

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Kaneohe Beach (Park) (Kaneohe Marine Corps Air Station)

3593	HDFG: 14	13-16 Jan. 1967	(1)
3594	HDFG: 6	13, 14 Jan. 1969	(1)
3595	HDFG: 6	13-15 Jan. 1970	(1)
3596	HDFG: 12	7 Aug. 1970	(1)

Halekou Pond (Kaneohe Marine Corps Air Station)

3597	HDFG: 3	24 July 1968	(1)
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Kawainui - Pond - Swamp

3598	5, Christmas Count	23 Dec. 1962	ANON63a
3599	HDFG: 1	14-18 Jan. 1963	(1)
3600	USFWS: 1	18 Aug. 1964	(12)
3601	USFWS: 0	30 Aug. 1964	(12)
3602	HDFG: 7	8-10 Jan. 1968	(1)
3603	4 seen	June 1969	YUEH69
3604	DHFG: 8	13-15 Jan. 1970	(1)
3605	HDFG: 0	12 Apr. 1972	(1)
3606	HDFG: 0	1 Aug. 1975	(2)
3607	HDFG: 0	15 Jan. 1976	(2)
3609	HDFG: 0	4-5 Aug. 1976	(2)
3610	HDFG: 0	13 Jan. 1977	(2)
3611	HDFG: 11	27, 28 July 1977	(2)
3612	as many as 7 seen	(week of 20 Nov. 1977)	SHAR78a
3613	Shallenberger: not listed among the regular inhabitants of the main marsh until this year when storm runoff in early May carried new sediment...left partially exposed mud flats...2 stilts seen...more later...successful nesting of at least 2 pairs	1977	(3)
3614	HDFG: 0	12, 13 Jan. 1978	(2)
3615	HDFG: 0	27, 28, 30 July 1978	(5)

3616	HDFG: 0	15, 16, 20 Jan. 1979	(5)
3617	HDFG: 0	1, 2 Aug. 1979	(5)
3618	HDFG: 0	14, 15, 16 Jan. 1980	(5)

Kawainui Pasture - Berm - Hamakua Ditch - Hamakua Drive - Maunawili Stream

3619	HDFG: 0	4, 5 AUG. 1976	(2)
3620	HDFG: 0	27, 28 July 1977	(2)
3621	Shallenberger: as many as 16 (visits on 1, 20, 23, 28 May; 15 Aug.)	(1977)	(3)
3622	HDFG: 10	12, 13 Jan. 1978	(2)
3623	HDFG: 3	27, 28, 30 Jul. 1978	(5)
3624	HDFG: 5	15, 16, 20 Jan. 1979	(5)
3625	HDFG: 0	1, 2 Aug. 1979	(5)
3626	HDFG: 2	14-16 Jan. 1980	(5)

Lanikai

3627	HDFG: 4	8 Aug. 1973	(1)
3628	HDFG: 0	27-28 July 1977	(2)
3629	7, Christmas Count	18 Dec. 1977	PYLR78a

Olomana Saddle City

3630	HDFG: 0	1-2 Aug. 1979	(5)
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PUULOA

Fort Kamehameha - Hickam Harbor

3631	HDFG:	7	14-17 Jan. 1958	(1)
3632	HDFG:	17	7-16 Jan. 1959	(1)
3633	HDFG:	5	10-13 Jan. 1961	(1)
3634	HDFG:	21	15-17 Jan. 1962	(1)
3635	HDFG:	8	14-18 Jan. 1963	(1)
3636	HDFG:	15	15 Jan. 1964	(1)
3637	HDFG:	12	14 Jan. 1965	(1)
3638	HDFG:	19	13-14 Jan. 1966	(1)
3639	HDFG:	2	13-16 Jan. 1967	(1)
3640	HDFG:	6	8-10 Jan. 1968	(1)
3641	seen		14 Jan. 1968	GAUJ68c
3642	HDFG:	15	24 July 1968	(1)
3643	HDFG:	2	10 Nov. 1968	KAIC68b
3644	a few		11 Dec. 1968	KAIC69a
3645	seen		22 Dec. 1968	MCNT69
3646	HDFG:	2	13-14 Jan. 1969	(1)
3647	seen		9 Mar. 1969	KAIC69b
3648	none seen		4 July 1969	KOJU69

3649	HDFG:	10	24 July 1969	(1)
3650	HDFG:	11	13-15 Jan. 1970	(1)
3651	HDFG:	15	7 Aug. 1970	(1)
3652	HDFG:	7	27 July 1971	(1)
3653	HDFG:	30+	11 Dec. 1971	KAIC72a
3654	9 seen		9 Jan. 1972	MULW72c
3655	HDFG:	0	12 Apr. 1972	(1)
3656	HDFG:	10	26 Aug. 1972	KAIC72c
3657	HDFG:	32	14 Jan. 1973	WINW73b
3658	HDFG:	19	8 Aug. 1973	(1)
3659	HDFG:	4	15 Jan. 1974	(1)
3660	HDFG:	6	1, 5 Aug. 1974	(1)
3661	HDFG:	3	1 Aug. 1975	(1)
3662	HDFG:	5	15 Jan. 1976	(2)
3663	HDFG:	5	4-5 Aug. 1976	(2)
3664	HDFG:	21	13 Jan. 1977	(2)
3665	10 seen		29 Jan. 1977	PYLR78c
3666	HDFG:	7	27, 28 July 1977	(2)
3667	28 seen		26 Dec. 1977	PYLR78c
3668	HDFG:	24	12, 13 Jan. 1978	(2)

3669	HDFG:	3	27, 28, 30 July 1978	(5)
3670	HDFG:	0	15, 16, 20 Jan. 1979	(5)
3671	HDFG:	4	1, 2 Aug. 1979	(5)
3672	HDFG:	17	14, 15 Jan. 1980	(5)
Honouliuli				
3673	HDFG:	8	14 Jan. 1965	(1)
3674	HDFG:	5	13-14 Jan. 1966	(1)
3675	Banko:	5	22 Oct. 1966	(18)
3676	HDFG:	6	13-16 Jan. 1967	(1)
3677	HDFG:	3	8-10 Jan. 1968	(1)
3678	HDFG:	0	12 Apr. 1972	(1)
3679	HDFG:	12	1-5 Aug. 1974	(1)
3680	HDFG:	0	1 Aug. 1975	(1)
3681	HDFG:	2	15 Jan. 1976	(2)
3682	HDFG:	0	4-5 Aug. 1976	(2)
3683	HDFG:	0	27, 28 July 1977	(2)
3684	HDFG:	5	12, 13 Jan. 1978	(2)
3685	HDFG:	0	27, 28, 30 July 1978	(5)
3686	HDFG:	0	15, 16, 20 Jan. 1979	(5)
3687	HDFG:	0	1, 2 Aug. 1979	(5)

3688	HDFG:	0	14, 15, 16 Jan. 1980	(5)
West Loch Unit (Holouliuli)				
Pearl Harbor National Wildlife Refuge				
3689	HDFG:	9	15 Jan. 1974	(2)
3690	HDFG:	0	1 Aug. 1975	(2)
3691	HDFG:	0	15 Jan. 1976	(2)
3692	USFWS:	5	Jan. 1976	(13)
3693	USFWS:	33, incl. 2 young	17 July 1976	(13)
3694	USFWS:	13	28 July 1976	(13)
3695	USFWS:	16	22 July 1976	(13)
3696	USFWS:	13	2 Aug. 1976	(13)
3697	HDFG:	8	4, 5 Aug. 1976	(2)
3698	USFWS:	7	6 Aug. 1976	(13)
3699	USFWS:	6	10 Aug. 1976	(13)
3700	USFWS:	12	12 Aug. 1976	(13)
3701	USFWS:	3	19 Aug. 1976	(13)
3702	USFWS:	12	3 Sep. 1976	(13)
3703	USFWS:	55	17 Sep. 1976	(13)
3704	USFWS:	51	18 Sep. 1976	(13)
3705	USFWS:	27	21 Sep. 1976	(13)
3706	USFWS:	7	24 Sep. 1976	(13)

3707	USFWS:	38	25 Sep. 1976	(13)
3708	USFWS:	14	30 Sep. 1976	(13)
3709	USFWS:	26	2 Oct. 1976	(13)
3710	USFWS:	50	6 Oct. 1976	(13)
3711	USFWS:	25	7 Oct. 1976	(13)
3712	USFWS:	18	9 Oct. 1976	(13)
3713	USFWS:	6	9 Oct. 1976	(13)
3714	USFWS:	8	13 Oct. 1976	(13)
3715	USFWS:	56	14 Oct. 1976	(13)
3716	USFWS:	7	15 Oct. 1976	(13)
3717	USFWS:	55	16 Oct. 1976	(13)
3718	USFWS:	17	17 Oct. 1976	(13)
3719	USFWS:	9	22 Oct. 1976	(13)
3720	USFWS:	42	23 Oct. 1976	(13)
3721	USFWS:	42	29 Oct. 1976	(13)
3722	USFWS:	40	30 Oct. 1976	(13)
3723	USFWS:	33	1 Nov. 1976	(13)
3724	USFWS:	14	4 Nov. 1976	(13)
3725	USFWS:	12	5 Nov. 1976	(13)
3726	USFWS:	15	11 Nov. 1976	(13)

3727	USFWS:	57	12 Nov. 1976	(13)
3728	USFWS:	178	13 Nov. 1976	(13)
3729	USFWS:	68	14 Nov. 1976	(13)
3730	USFWS:	61	18 Nov. 1976	(13)
3731	USFWS:	28	19 Nov. 1976	(13)
3732	USFWS:	26	22 Nov. 1976	(13)
3733	USFWS:	8	30 Nov. 1976	(13)
3734	USFWS:	22	2 Dec. 1976	(13)
3735	USFWS:	17	7 Dec. 1976	(13)
3736	USFWS:	11	11 Dec. 1976	(13)
3737	USFWS:	7	13 Dec. 1976	(130
3738	USFWS:	7	14 Dec. 1976	(13)
3739	USFWS:	9	10 Jan. 1976	(13)
3740	HDFG:	9	13 Jan. 1977	(13)
3741	USFWS:	4	31 Jan. 1977	(13)
3742	USFWS:	35	23 Feb. 1977	(13)
3743	USFWS:	2	10 Mar. 1977	(13)
3744	USFWS:	48	2 Apr. 1977	(13)
3745	USFWS:	57	14 Apr. 1977	(13)
3746	USFWS:	59	15 Apr. 1977	(13)

3747	USFWS:	present	16 Apr. 1977	(13)
3748	USFWS:	53	17 Apr. 1977	(13)
3749	USFWS:	64	18 Apr. 1977	(13)
3750	USFWS:	57	19 Apr. 1977	(13)
3751	USFWS:	64	22 Apr. 1977	(13)
3752	USFWS:	present	23 Apr. 1977	(13)
3753	USFWS:	65	24 Apr. 1977	(13)
3754	USFWS:	73	26 Apr. 1977	(13)
3755	USFWS:	84	28 Apr. 1977	(13)
3756	USFWS:	94	29 Apr. 1977	(13)
3757	USFWS:	present	30 Apr. 1977	(13)
3758	USFWS:	82	1 May 1977	(13)
3759	USFWS:	85	5 May 1977	(13)
3760	USFWS:	51	8 May 1977	(13)
3761	USFWS:	43	12 May 1977	(13)
3762	USFWS:	18	16 May 1977	(13)
3763	USFWS:	22	19 May 1977	(13)
3764	USFWS:	24	20 May 1977	(13)
3765	USFWS:	28	23 May 1977	(13)
3766	USFWS:	25	26 May 1977	(13)

3767	USFWS:	26	27 May 1977	(13)
3768	USFWS:	24	31 May 1977	(13)
3769	USFWS:	21	2 June 1977	(13)
3770	USFWS:	27	3 June 1977	(13)
3771	USFWS:	24	6 June 1977	(13)
3772	USFWS:	22	10 June 1977	(13)
3773	USFWS:	20	15 June 1977	(13)
3774	USFWS:	20	20 June 1977	(13)
3775	USFWS:	20, incl. 1 young	30 June 1977	(13)
3776	USFWS:	18	1 July 1977	(13)
3777	USFWS:	12	3 July 1977	(13)
3778	USFWS:	5	8 July 1977	(13)
3779	USFWS:	15	12 July 1977	(13)
3780	USFWS:	13	14 July 1977	(13)
3781	USFWS:	11	18 July 1977	(13)
3782	USFWS:	38	19 July 1977	(13)
3783	USFWS:	31	20 July 1977	(13)
3784	USFWS:	14	24 July 1977	(13)
3785	USFWS:	35	26 July 1977	(13)
3786	USFWS:	29	27 July 1977	(13)

3787	USFWS: 29	28 July 1977	(13)
3788	USFWS: 8	27 Aug. 1977	(13)
3789	USFWS: 27	8 Sep. 1977	(13)
3790	USFWS: 50+	11 Sep. 1977	(13)
3791	extremely abundant	11 Sep. 1977	STEM77
3792	USFWS: 34	14 Sep. 1977	(13)
3793	USFWS: 114	22 Sep. 1977	(13)
3794	USFWS: 2	28 Sep. 1977	(13)
3795	USFWS: 0	4 Oct. 1977	(13)
3796	USFWS: 23	17 Oct. 1977	(13)
3797	USFWS: 74	25 Oct. 1977	(13)
3798	USFWS: 137	28 Oct. 1977	(13)
3799	USFWS: 10	30 Nov. 1977	(13)
3800	USFWS: 3	17 Dec. 1977	(13)
3801	USFWS: 5	27 Dec. 1977	(13)
3802	USFWS: censuses ranged from 2 to 178, ave. 32	2 Aug. 1976-27 Dec.'77	(45)
3803	USFWS: 14	7 Jan. 1978	(13)
3804	USFWS: 7	12 Jan. 1978	(13)
3805	USFWS: 6	23 Jan. 1978	(13)
3806	USFWS: 7	21 Jan. 1978	(13)

3807	USFWS:	7	13 Feb. 1978	(13)
3808	USFWS:	7	14 Feb. 1978	(13)
3809	USFWS:	7	15 Feb. 1978	(13)
3810	USFWS:	7	16 Feb. 1978	(13)
3811	USFWS:	6	17 Feb. 1978	(13)
3812	USFWS:	6	20 Feb. 1978	(13)
3813	USFWS:	23	21 Feb. 1978	(13)
3814	USFWS:	31	22 Feb. 1978	(13)
3815	USFWS:	34	23 Feb. 1978	(13)
3816	USFWS:	37	24 Feb. 1978	(13)
3817	USFWS:	35	27 Feb. 1978	(13)
3818	USFWS:	35	28 Feb. 1978	(13)
3819	USFWS:	46	1 Mar. 1978	(13)
3820	USFWS:	38	2 Mar. 1978	(13)
3821	USFWS:	29	3 Mar. 1978	(13)
3822	USFWS:	48	6 Mar. 1978	(13)
3823	USFWS:	56	7 Mar. 1978	(13)
3824	USFWS:	72	8 Mar. 1978	(13)
3825	USFWS:	72	9 Mar. 1978	(13)
3826	USFWS:	75	13 Mar. 1978	(13)

3827	USFWS:	66	14 Mar. 1978	(13)
3828	USFWS:	66	15 Mar. 1978	(13)
3829	USFWS:	80	20 Mar. 1978	(13)
3830	USFWS:	73	25 Mar. 1978	(13)
3831	USFWS:	72	27 Mar. 1978	(13)
3832	USFWS:	109 max. no. censused (in 36 counts from Jan.- Nov. 1978)	2 Apr. 1978	(45)
3833	USFWS:	72	3 Apr. 1978	(13)
3834	USFWS:	59	5 Apr. 1978	(13)
3835	USFWS:	71	7 Apr. 1978	(13)
3836	USFWS:	63, incl. 1 young	18 Apr. 1978	(13)
3837	USFWS:	23	20 Apr. 1978	(13)
3838	Walker:	1 young chick seen	22 Apr. 1978	(45)
3839	Walker:	2 2-seek old chicks seen	30 Apr. 1978	(45)
3840	USFWS:	30	9 May 1978	(13)
3841	USFWS:	35	10 May 1978	(13)
3842	USFWS:	33	25 May 1978	(13)
3843	USFWS:	30	31 May 1978	(13)
3844	USFWS:	20	6 June 1978	(13)
3845	USFWS:	22	12 June 1978	(13)

3846	USFWS:	24	16 June 1978	(13)
3847	USFWS:	25	17 June 1978	(13)
3848	USFWS:	17	18 June 1978	(13)
3849	USFWS:	20, incl. 2 young	20 June 1978	(13)
3850	USFWS:	21	21 June 1978	(13)
3851	USFWS:	18, incl. 1 young	22 June 1978	(13)
3852	USFWS:	14	1 July 1978	(13)
3853	USFWS:	22	2 July 1978	(13)
3854	USFWS:	18	6 July 1978	(13)
3855	USFWS:	15	7 July 1978	(13)
3856	USFWS:	10	9 July 1978	(13)
3857	USFWS:	18	12 July 1978	(13)
3858	USFWS:	16	13 July 1978	(13)
3859	USFWS:	14	15 July 1978	(13)
3860	USFWS:	16	16 July 1978	(13)
3861	USFWS:	12	21 July 1978	(13)
3862	USFWS:	12	22 July 1978	(13)
3863	USFWS:	9	23 July 1978	(13)
3864	USFWS:	9	24 July 1978	(13)
3865	USFWS:	13	26 July 1978	(13)

3866	USFWS:	10	27 July 1978	(13)
3867	USFWS:	12	28 July 1978	(13)
3868	USFWS:	7	29 July 1978	(13)
3869	USFWS:	7	30 July 1978	(13)
3870	USFWS:	7	31 July 1978	(13)
3871	USFWS:	6	2 Aug. 1978	(13)
3872	USFWS:	8	3 Aug. 1978	(13)
3873	USFWS:	14	4 Aug. 1978	(13)
3874	USFWS:	12	7 Aug. 1978	(13)
3875	USFWS:	11	8 Aug. 1978	(13)
3876	USFWS:	4	10 Aug. 1978	(13)
3877	USFWS:	3	11 Aug. 1978	(13)
3878	USFWS:	39	12 Aug. 1978	(13)
3879	USFWS:	27	14 Aug. 1978	(13)
3880	USFWS:	17	15 Aug. 1978	(13)
3881	USFWS:	62	17 Aug. 1978	(13)
3882	USFWS:	63	21 Aug. 1978	(13)
3883	USFWS:	106	6 Sep. 1978	(13)
3884	USFWS:	63	9 Sep. 1978	(13)
3885	USFWS:	95	10 Sep. 1978	(13)

3886	USFWS:	93	14 Sep. 1978	(13)
3887	USFWS:	8	1 Oct. 1978	(13)
3888	USFWS:	4	7 Oct. 1978	(13)
3889	USFWS:	0	8 Oct. 1978	(13)
3890	USFWS:	3	14 Oct. 1978	(13)
3891	USFWS:	4	15 Oct. 1978	(13)
3892	USFWS:	5	22 Oct. 1978	(13)
3893	USFWS:	0	29 Oct. 1978	(13)
3894	USFWS:	39	1 Nov. 1978	(13)
3895	USFWS:	0	3 Nov. 1978	(13)
3896	USFWS:	8	4 Nov. 1978	(13)
3897	USFWS:	11	6 Nov. 1978	(13)
3898	USFWS:	36	8 Nov. 1978	(13)
3890	USFWS:	857 seen on 34 of 36 censuses (ave. 25 per census when present)	28 Jan.-8 Nov. 1978	(45)
3900	USFWS:	27	10 Nov. 1978	(13)
3901	USFWS:	22	13 Nov. 1978	(13)
3902	USFWS:	23	14 Nov. 1978	(13)
3903	USFWS:	45	15 Nov. 1978	(13)
3904	USFWS:	10	27 Nov. 1978	(13)
3905	USFWS:	13	30 Nov. 1978	(13)

3906	USFWS:	2	1 Dec. 1978	(13)
3907	USFWS:	0	8 Dec. 1978	(13)
3908	USFWS:	2	9 Dec. 1978	(13)
3909	USFWS:	0	11 Dec. 1978	(13)
3910	USFWS:	3	12 Dec. 1978	(13)
3911	USFWS:	0	13 Dec. 1978	(13)
3912	USFWS:	0	14 Dec. 1978	(13)
3913	USFWS:	0	15 Dec. 1978	(13)
3914	USFWS:	0	16 Dec. 1978	(13)
3915	USFWS:	4	18 Dec. 1978	(13)
3916	USFWS:	4	19 Dec. 1978	(13)
3917	USFWS:	4	20 Dec. 1978	(13)
3918	USFWS:	7	21 Dec. 1978	(13)
3919	USFWS:	0	22 Dec. 1978	(13)
3920	USFWS:	0	24 Dec. 1978	(13)
3921	USFWS:	4	27 Dec. 1978	(13)
3922	USFWS:	7	29 Dec. 1978	(13)
3923	USFWS:	0	30 Dec. 1978	(13)
2924	USFWS:	several nests reported	1978	(45)
3925	USFWS:	0	2 Jan. 1979	(13)

3926	USFWS:	0	3 Jan. 1979	(13)
3927	USFWS:	0	5 Jan. 1979	(13)
3928	USFWS:	0	8 Jan. 1979	(13)
3929	USFWS:	2	10 Jan. 1979	(13)
3930	USFWS:	2	15 Jan. 1979	(13)
3931	USFWS:	4	16 Jan. 1979	(13)
3932	USFWS:	0	18 Jan. 1979	(13)
3933	USFWS:	4	22 Jan. 1979	(13)
3934	USFWS:	4	23 Jan. 1979	(13)
3935	USFWS:	4	24 Jan. 1979	(13)
3936	USFWS:	4	25 Jan. 1979	(13)
3937	USFWS:	0	31 Jan. 1979	(13)
3938	USFWS:	7	2 Feb. 1979	(13)
3939	USFWS:	4	5 Feb. 1979	(13)
3940	USFWS:	4	6 Feb. 1979	(13)
3941	USFWS:	14	13 Feb. 1979	(13)
3942	USFWS:	0	14 Feb. 1979	(13)
3943	USFWS:	4	15 Feb. 1979	(13)
3944	USFWS:	0	19 Feb. 1979	(13)
3945	USFWS:	12	21 Feb. 1979	(13)

3946	USFWS:	14	27 Feb. 1979	(13)
3947	USFWS:	18	3 Mar. 1979	(13)
3948	USFWS:	13	5 Mar. 1979	(13)
3949	USFWS:	15	6 Mar. 1979	(13)
3950	USFWS:	11	28 Mar. 1979	(13)
3951	HDFG:	7	1,2 Aug. 1979	(5)
3952	USFWS:	10	25 Sep. 1979	(13)
3953	USFWS:	0	Oct. 1979	(13)
3954	USFWS:	22	8 Nov. 1979	(13)
3955	USFWS:	36	26 Nov. 1979	(13)
3956	USFWS:	17	6 Dec. 1979	(13)
3957	USFWS:	0	13 Dec. 1979	(13)
3958	HDFG:	6	14-16 Jan. 1980	(5)
3958a	Coleman:	mean breeding population of 40 censused	1978-1980	(51)
3959	USFWS:	70, ave. daily use	15 Nov.-15 Dec. 1981	(13)
3960	USFWS:	10, ave. daily use	16 Dec. 1981-15 Jan. 1982	(13)
3961	USFWS:	5, ave. daily use	16 Jan.-15 Feb. 1982	(13)
3962	USFWS:	0, ave. daily use	16 Feb.-31 Mar. 1982	(13)
3963	USFWS:	6, ave. daily use	Apr. 1982	(13)
3964	USFWS:	10, ave. daily use	May 1982	(13)

3965	USFWS: 3, ave. daily use	June 1982	(13)
3966	HDFG: 63	13 Jan. 1977	(45)
3967	Shallenberger: maximum of 44 seen...recent counts by USFWS have ranged as high as 454 but the average of more than 75 counts over the last year is only slightly above 100...breeding has been recorded	June, Aug. 1977	(45)
3968	USFWS: 454	2 Aug. 1976-27 Dec. 1977	(45)
3969	USFWS: numbers from 136 censuses ranged from 4 to 454, ave. 123	2 Aug. 1976-27 Dec. 1977	(45)
3970	Shallenberger: ave. number censused was 60 in 1978, prior to 1978 ave. number was 100+; maximum seen prior to (1977) study was 454, in 1978 maximum number seen was 115...no explanation for differences except to say that the method of observation, times of year or other factors such as unusual flocking behavior may be involved. Waiawa still a significant area for stilt in terms of the number it supports, perhaps more so than Honouliuli	(1977)	(45)
3971	2,146 seen on 36 of 36 censuses (ave. 60 per census)	28 Jan.-8 Nov. 1978	(45)
3972	110 maximum number censused (36 censuses Jan.-Nov. 1978)	25 Nov.-15 Dec. 1978	(45)
3973	breeding, nesting and production of young evidenced or reported	(1978)	(13)
3974	USFWS: 40 ave. daily use	15 Nov.-15 Dec. 1981	(13)
3975	USFWS: 30, ave. daily use	16 Dec. 1981-15 Jan. 1982	(13)
3976	USFWS: 2, ave. daily use	16 Jan.-15 Feb. 1982	(13)
3977	USFWS: not censused	16 Feb.-31 mar. 1982	(13)

3978	USFWS: 6, ave. daily use	Apr. 1982	(13)
3979	USFWS: 8, ave. daily use	May 1982	(13)
3980	USFWS: 6, ave. daily use	June 1982	(13)
Makalapa Pond			
3981	seen	28 Feb. 1954	BOTI54
3982	12 seen	22 Aug. 1954	PEDB54
Puuloa - Navy - Rifle Range			
3983	30-40 seen	1 Oct. 1956	KINJ56a
3984	32 seen	27 oct. 1957	SMAM57
3985	only 3 seen...met with horrible sight of bare land (now ruined for water birds)	9 Nov. 1958	HANC58b
HONOLULU			
Keehi Lagoon and Islets			
3986	Northwood: parties kept arriving	1 Dec. 1938	(20)
3987	very few seen in past weeks	(June 1962	ORDW62b
3988	several persent	16 Dec. 1962	ORDW63b
3989	30 counted	13 Jan. 1963	ORDW63c
3990	Banko: 0	26 Nov. 1965	(18)
3991	3-4 dozen	12 Sep. 1965	CASE65
3992	0 noted	26 Nov. 1965	DONW66b
3993	30 counted	10 Oct. 1965	WALL66

3994	Banko: counts range from 0 to 80...no evidence of breeding	(1966)	(17)
3995	Banko: 80 censused	8 July 1966	(18)
3996	Banko: 0 seen	15 July 1966	(18)
3997	Banko: 0 seen	25 July 1966	(18)
3998	Banko: 10 censused	28 Aug. 1966	(18)
3999	a dozen	10 Oct. 1966	DONW66c
4000	Banko: counts vary 0-80	1966	(11)
4001	HDFG: 8	24 July 1968	(1)
4002	HDFG: 2	13, 14 Jan. 1969	(1)
4003	HDFG: 56	24 July 1969	(1)
4004	HDFG: 6	13-15 Jan. 1970	(1)
4005	HDFG: 37	7 Aug. 1970	(22)
4006	all left after 31 Jan. 1971...not yet returned by April 30...total of 60 censuses	12 Dec. 1970-28 Apr. 1971	WALR72
4007	HDFG: 90	27 July 1971	(1)
4008	USFWS: 97 counted on 1 visit to 17 census stations	July 1971	(12)
4009	USFWS: 38 and 53 counted on 2 visits to 17 census stations	Aug. 1971	(12)
4010	USFWS: 42 and 87 counted on 2 visits to 17 census stations	Sep. 1971	(12)

4011	USFWS: 36 and 114 counted on 2 visits to 17 census stations	Oct. 1971	(12)
4012	USFWS: 40 and 98 counted on 2 visits to 17 census stations	Nov. 1971	(12)
4013	USFWS: 28 and 105 counted on 2 visits to 17 census stations	Dec. 1971	(12)
4014	HDFG: 0	12 Apr. 1972	(1)
4015	HDFG: 43	8 Aug. 1973	(1)
4016	HDFG: 0	15 Jan. 1974	(1)
4017	HDFG: 132	1-5 Aug. 1974	(1)
4018	HDFG: 89	1 Aug. 1975	(1)
4019	HDFG: 11	15 Jan. 1976	(2)
4020	HDFG: 25	4-5 Aug. 1976	(2)
4021	HDFG: 39	13 Jan. 1977	(2)
4022	HDFG: 39	27, 28 July 1977	(2)
4023	a few	8 Jan. 1978	HODP77
4024	HDFG: 18	12, 13 Jan. 1978	(2)
4025	HDFG: 7	27, 28, 30 July 1978	(5)
4026	HDFG: 6	15, 16, 20 Jan. 1979	(5)
4027	HDFG: 4	1, 2 Aug. 1979	(5)
4028	HDFG: 6	14, 15, 16 Jan. 1980	(5)

Mitigation Islets, Keehi Lagoon

4029	Walder: 12 max. censused	Jan.-Mar. 1978	(45)
4030	Walder: 14 max. censused	April-June 1978	(45)
4031	Walder: 3 max. no. seen	July-Sept. 1978	(45)
4032	Walder: 12 max. no. censused...numbers often a function of human activities...maximum number seen was far less than the greatest number recorded for the island at station No. 13 (Point Island) which was altered by dredging and which the 3 mitigation islands were intended to replace...over 80 seen on several occasions on this island in the pre-runway construction period, however this is probably a function of the general decrease over the entire study area rather than any lack of interest in these new islets...	Oct.-Dec. 1978	(45)

Keehi Lagoon and Fort Kamehameha

4033	Walder: Total of 113 censuses in all seasons of year from 1971-1978 yielded following numbers seen: 114 on Station, 0 off Station 1971 124 on Station, 0 off Station 1973 116 on Station, 0 off Station 1974 85 on Station, 15 off Station 1975 55 on Station, 29 off Station 1976 33 on Station, 0 off Station 1978 ...comparison between years shows a marked decrease in numbers seen on and off stations...data may be statistically defective due to the relatively low number of samples and variabilities mentioned, but a downward trend is indicated...even if only the unaltered stations and adjacent habitats are considered...suggesting that although only an estimated 20% of the feeding habitat was eliminated, the number using the study area decreased by up to 75%...though factors other than habitat alteration could have caused this reduction...perhaps by low reproduction in 1978 or individuals missed in the census	1 Jan. 1971-8 Nvo. 1978	(45)
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which may have been using the reef runway proper which was not censused, or adjacent areas...conclude that new habitats created, particularly at Honouliuli and Waiawa, provide an important degree of mitigation for the loss of habitat at the site of the reef runway...although Leeward Oahu Population has apparently lost a significant area of feeding habitat because of the reef runway construction, it has gained important new habitat for all phases of its life cycle

Moanalua - Mapunapuna - Kalihi Flats

4034	Northwood:	33	9 Dec. 1933	(20)
4035	Northwood:	ca. 120	24 Nov. 1938	(20)
4036	Northwood:	ca. 150	25 Nov. 1938	(20)
4037	Northwood:	seen	28 Nov. 1938	(20)
4038	Northwood:	84	4 Dec. 1938	(20)
4039	Northwood:	250 est.	18 Dec. 1938	(20)
4040	Northwood:	3-4 parties	26 Dec. 1938	(20)
4041	Northwood:	seen	2 Jan. 1939	(20)
4042	Northwood:	plenty	15 Jan. 1939	(20)
4043	Northwood:	6	22 Jan. 1939	(20)
4044	Northwood:	0	5 Feb. 1939	(20)
4045	Northwood:	small parties	5 mar. 1939	(20)
4046	Northwood:	20	2 Apr. 1939	(20)
4047	Northwood:	8	4 July 1939	(20)

4048	Northwood:	20-30	3 Sep. 1939	(20)
4049	Northwood:	ca. 200	28 Dec. 1939	(20)
4050	Northwood:	0	27 Jan. 1940	(20)
4051	Northwood:	0	9 Mar. 1940	(20)
4052	Northwood:	ca. 150	26 Apr. 1940	(20)
4053	Northwood:	18	24 Aug. 1940	(20)
4054	Northwood:	seen	22 Sep. 1940	(20)
4055	Northwood:	ca. 200	25 Dec. 1940	(20)
4056	132	counted	July 1943	ANON43
4057	230	seen	13 Nov. 1943	JOHE43
4058	128	counted	15 nov. 1943	ANON44
4059	ca.	30	4 June 1944	CANH44
4060		33	9 July 1944	CANH44
4061		only 3	21 July 1944	CANH44
4062	ca.	200	25 July 1944	CANH44
4063		212	12 Sep. 1944	COGH45
4064	200	seen	14 Oct. 1944	COGH45
4065	100+	seen	Oct. 1944	KUHB44
4066	11	seen	Oct. 1944	KUHB44
4067		200	14 Dec. 1944	COGH45

4068	150	17 Dec. 1944	MUNG45
4069	155	17 Dec. 1944	COGH45
4070	over 150 may be seen on good days...after the nesting season	1944	CANH44
4071	very few	23 Dec. 1945	PETR46
4072	0	10 Feb. 1946	WEBJ46
4073	24 seen...numbers greatly reduced since extensive filling began	14 Sep. 1947	TAYD47

Nuuanu Reservoirs (2, 3, 4)

4074	HDFG: 1	1-5 Aug. 1974	(1)
4075	HDFG: 0	1 Aug. 1975	(1)
4076	HDFG: 0	15 Jan. 1976	(2)
4077	HDFG: 0	4-5 Aug. 1976	(2)
4078	HDFG: 0	13 Jan. 1977	(2)
4079	HDFG: 0	27, 28 July 1977	(2)
4080	HDFG: 0	12, 13 Jan. 1978	(2)
4081	HDFG: 0	27, 28, 30 July 1978	(5)
4082	HDFG: 0	15, 16, 20 Jan. 1979	(5)
4083	HDFG: 0	1, 2 Aug. 1979	(5)
4084	HDFG: 0	14-16 Jan. 1980	(5)
4085	HDFG: 0	31 July, 1 Aug. 1980	(5)

4086	HDFG: 0	12 Jan. 1981	(5)
4087	HDFG: to be excluded from future censuses due to non-use	(July 1981)	(5)
Salt Lake			
4088	HDFG: 0	4, 10 Jan. 1956	(1)
4089	H.A.S. members recorded ca. 1000	26 Jan. 1958	(1)
4090	2, Christmas Count	26 Dec. 1960	ANON61a
4091	1, Christmas Count	31 Dec. 1961	ANON62
4092	2 noted	14 Jan. 1962	MENM62
4093	4 seen	16 Dec. 1962	ORDW63b
4094	3, Christmas Count	23 Dec. 1962	ANON63a
4095	HDFG: 5	14 Jan. 1965	(1)
4096	HDFG: 1	24 July 1969	(1)
4097	18 seen	4 Dec. 1969	DONW70
4098	numbers present	11 Jan. 1970	ANON70c
4099	HDFG: 13	13-15 Jan. 1970	(1)
4100	9 seen; 50+ was a normal complement	8 Mar. 1970	MULW70a
4101	HDFG: 38	7 Aug. 1970	(1)
4102	35 counted	13 Sep. 1970	ANON71a
4103	12 counted	10 Jan. 1971	MULW71c
4104	HDFG: 9	27 July 1971	(1)

4105	HDFG: 4	12 Apr. 1972	(1)
4106	23 counted...peninsula filled in...creating two separate bodies of water...in the last few days	19 June 1972	MULW72e
4107	21 sighted	10 Sep. 1972	MULW72f
4108	17 counted	week of 20 Oct. 1972	HAWA73
4109	numbers ranged from 11-37...14 trips	Dec. 1969-Oct. 1972	HAWA73
4110	15 counted	12 Nov. 1972	WINW73a
4111	19 censused	17 Dec. 1972	MULW73a
4112	37 was greatest no. observed at any one time during the past two years...as Salt Lake is now it offers only marginal prospects	(1972)	MULW72b
4113	17 seen	14 Jan. 1973	WINW73b
4114	8 observed...partial count...from two vantage points	9 July 1973	MULM73a
4115	HDFG: 11...Salt Lake now unsuitable for stilt	8 Aug. 1973	(1)
4116	7, Christmas Count	29 Dec. 1973	WILE74b
4117	HDFG: 2...Salt Lake now unsuitable for stilt	15 Jan. 1974	(1)
4118	HDFG: 4	1-5 Aug. 1974	(1)
4119	HDFG: few were noted...Salt Lke being filled for eventual use as a golf course	1 July 1973-30 June 1974	(21)
4120	HDFG: 0	1 Aug. 1975	(1)
4121	HDFG: 12	15 Jan. 1976	(2)
4122	HDFG: 9	13 Jan. 1977	(2)

4123	19-24, counts on ten dates on remnants of Salt Lake	18 Dec. 1977-5 Mar. 1978	PYLR78a
4124	HDFG: 13	27, 28 July 1977	(2)
4125	15-20 sighted on remnant of Salt Lake	27 Sep. 1977	PYLR78b
4126	HDFG: 26	12, 13 Jan. 1978	(2)
4127	5 nests extant	Spring 1978	PYLR78d
4128	HDFG: 19	27, 28, 30 July 1978	(5)
4129	HDFG: 13	15, 16, 20 Jan. 1979	(5)
4130	HDFG: 16	1, 2 Aug. 1979	(5)
4131	HDFG: 7	14-16 Jan. 1980	(5)
4132	HDFG: 6	27 Aug. 1980	(5)
4133	HDFG: 4	29 Sep. 1980	(5)
4134	HDFG: 3	31 Oct. 1980	(5)
4135	HDFG: 3	28 Nov. 1980	(5)
4136	HDFG: 0	29 Dec. 1980	(5)
4136a	Coleman: mean breeding population of 6 censused	1978-1980	(51)
4137	HDFG: 2	12 Jan. 1981	(5)
Sand (Quarantine) Island			
4138	common; still abundant elsewhere on Oahu	(1892-1897)	PERR03
4139	Northwood: a few present	24 Aug. 1940	(20)
4140	4, Christmas Count	23 Dec. 1956	HATG57

4141	seen	10 Apr. 1960	SAYD60
4142	30, Christmas Count	31 Dec. 1961	ANON62
4143	saw some	11 Nov. 1962	TITM62
4144	35, Christmas Count	23 Dec. 1962	ANON63a
4145	69, Christmas Count	29 Dec. 1963	ANON64
4146	75 counted	11 Oct. 1964	ROCR64
4147	14, Christmas Count	27 Dec. 1964	ANON65a
4148	19, Christmas Count	2 Jan. 1966	ANON66a
4149	70, possibly more	11 Sep. 1966	ORDW66a
4150	8, Christmas Count	26 Dec. 1966	ANON67a
4151	7, Christmas Count	31 Dec. 1967	ANON68
4152	1, Christmas Count	29 Dec. 1968	ANON69a
4153	several present	9 Nov. 1969	KAIC69d
4154	3 present	9 Jan. 1972	MULW72c
4155	0 seen	9 Apr. 1972	MULW72d
4156	HDFG: 0	15 Jan. 1976	(2)

KOKO HEAD

Bellows Air Force Base

4157	HDFG: 19	14-18 Jan. 1963	(1)
4158	HDFG: 11	15 Jan. 1964	(1)

4159	HDFG:	14	14 Jan. 1965	(1)
4160	HDFG:	5	13, 14 Jan. 1966	(1)
4161	Banko:	0 from road	23 Oct. 1966	(18)
4162	HDFG:	7	13-16 Jan. 1967	(1)
4163	HDFG:	7	8-10 Jan. 1968	(1)
4164	HDFG:	17	13, 14 Jan. 1969	(1)
4165	HDFG:	4	24 July 1969	(1)
4166	HDFG:	2	12 Apr. 1972	(1)
4167	HDFG:	0	1 Aug. 1975	(1)
4168	HDFG:	5	15 Jan. 1976	(2)
4169	HDFG:	3	4, 5 Aug. 1976	(2)
4170	HDFG:	0	13 Jan. 1977	(2)
4171	HDFG:	0	27, 28 July 1977	(2)
4172	HDFG:	3	12, 13 Jan. 1978	(2)
4173	HDFG:	2	27, 28, 30 July 1978	(5)
4174	HDFG:	3	15, 16, 20 Jan. 1979	(5)
4175	HDFG:	0	1, 2 Aug. 1979	(5)
4176	HDFG:	1	14-16 Jan. 1980	(5)
4177	HDFG:	0	12 Jan. 1981	(5)

Kuapa Pond

4178	several seen	11 Nov. 1945	PARR46
4179	9 seen	9 Nov. 1947	KLER47
4180	several seen	9 Nov. 1947	HAMI47
4181	49, Christmas Count	21 Dec. 1947	HATG48c
4182	2, Christmas Count	26 Dec. 1948	ROCR49
4183	38, Christmas Count	28 Dec. 1952	ANON53a
4184	71 seen	18 Jan. 1953	ANON53b
4185	2 seen	3 May 1953	HATG53b
4186	a few, Christmas Count	26 Dec. 1954	ANON55
4187	HDFG: 0	4-10 Jan. 1956	(1)
4188	125, Christmas Count	23 Dec. 1956	HATG57
4189	10 seen	11 may 1958	HATG58
4190	HDFG: 28	7-16 Jan. 1959	(1)
4191	present	8 Nov. 1959	HANC60a
4192	0; former nesting area being bulldozed for homes	10 Sep. 1960	ANON60b
4193	64, Christmas Count	26 Dec. 1960	ANON61a
4194	2 seen	20 Aug. 1961	ORDW61
4195	58 counted	8 Oct. 1961	HATG62
4196	25, Christmas Count	31 Dec. 1961	ANON62

4197	HDFG: 21	15-17 Jan. 1962	(1)
4198	1 seen	11 Mar. 1962	MENM62b
4199	0 since March	(June 1962)	ORDW62b
4200	HDFG: 44	14-18 Jan. 1963	(1)
4201	HDFG, USFWS: 21-44 seen in 4 counts...use declining because of subdivision development	(1964-1966)	(17)
4202	HDFG: 27	15 Jan. 1964	(1)
4203	75 seen	12 July 1964	KINM64
4204	HDFG: 25	30 Aug. 1964	(12)
4205	80 seen	24 Oct. 1964	ORDW64d
4206	present...water very low	20 June 1965	ANON65c
4207	0 present	20 June 1965	TITM65a
4208	0 noted	26 Nov. 1965	DONW66b
4209	6 counted	26 Nov. 1965	DONW66b
4210	HDFG: 28	26 May 1966	(12)
4211	Banko: 33	23 Oct. 1966	(18)
4212	HDFG: 42	24 July 1968	(1)
4213	HDFG: 51	24 July 1969	(1)
4214	ca. 52	12 Oct. (1969)	ANON70a
4215	HDFG: 0	4, 5 Aug. 1976	(2)

Paiko (Kuliouou) Lagoon

4216	a few censused, Christmas Count	26 Dec. 1954	ANON55
4217	HDFG: 0	4-10 Jan. 1956	(1)
4218	10 seen	22 July 1956	DRAL56
4219	5 censused, Christmas Count	23 Dec. 1956	HATG57
4220	0 seen	28 Apr. 1957	ROCR57b
4221	scores noted	24 Nov. 1957	CLAH58
4222	25+ seen	11 May 1958	HATG58
4223	35 censused, Christmas Count	21 Dec. 1958	ANON59
4224	HDFG: 14, Christmas Count	7-16 Jan. 1959	(1)
4225	present	10 Sep. 1960	ANON60b
4226	17, Christmas Count	26 Dec. 1960	ANON61a
4227	HDFG: 21	10-13 Jan. 1961	(1)
4228	50+ present	9 Apr. 1961	LUPD61b
4229	present	June (1961)	TITM61
4230	seen	30 Aug. 1961	LABA61
4231	seen	30 Aug. 1961	CARR62
4232	seen in small numbers	8 Oct. 1961	HATG62
4233	35, Christmas Count	31 Dec. 1961	ANON62
4234	HDFG: 62	15-17 Jan. 1962	(1)

4235	none seen since late February	(June 1962)	ORDW62b
4236	6 seen	10 June 1962	ORDW62b
4237	HDFG: 26	14-18 Jan. 1963	(1)
4238	HDFG, USFWS: ranged 6-62, 8 counts	(1964-1966)	(17)
4239	HDFG: 109	15 Jan. 1964	(1)
4240	HDFG: 20	30 Aug. 1964	(12)
4241	HDFG: 6	14 Jan. 1965	(1)
4242	22 counted	20 June 1965	ANON65c
4243	37 counted	26 Nov. 1965	DONW66b
4244	31 counted	26 Nov. 1965	DONW66b
4245	HDFG: 23	13, 14 Jan. 1966	(1)
4246	Banko: 10	20 Apr. 1966	(18)
4247	Banko: 0 seen	23 Oct. 1966	(18)
4248	HDFG: 16	13-16 Jan. 1967	(1)
4249	HDFG: 23	24 July 1968	(1)
4250	14 seen	15 Aug. 1969	YUEH69
4251	8 seen	19 Sep. 1969	YUEH69
4252	HDFG: 9	13-15 Jan. 1970	(1)
4253	HDFG: 16.5 mean weekly count	Apr. 1969-May 1970	ALLG72
4254	USFWS: 28	7 Aug. 1970	(22)

4255	19 counted	1 Jan. 1971	TSEM75
4256	18 counted	6 Jan. 1971	TSEM75
4257	14 counted	21 Jan. 1971	TSEM75
4258	12 counted	22 Jan. 1971	TSEM75
4259	3 counted	31 Feb. 1971	TSEM75
4260	2 counted	5 Feb. 1971	TSEM75
4261	0 seen	15 Feb. 1971	TSEM75
4262	0 seen	27 Feb. 1971	TSEM75
4263	0 seen	16 Mar. 1971	TSEM75
4264	0 seen	Mar.-June 1971	TSEM75
4265	6 counted	16 July 1971	TSEM75
4266	HDFG: 12	27 July 1971	(1)
4267	18 counted	6 Aug. 1971	TSEM75
4268	10 counted	7 Sep. 1971	TSEM75
4269	11 counted	21 Sep. 1971	TSEM75
4270	13 counted	29 Sep. 1971	TSEM75
4271	12 counted	7 Oct. 1971	TSEM75
4272	6 counted	12 Oct. 1971	TSEM75
4273	13 counted	13 Oct. 1971	TSEM75
4274	10 counted	13 Oct. 1971	TSEM75

4275	8 counted	27 Nov. 1971	TSEM75
4276	9 counted	30 Nov. 1971	TSEM75
4277	15 counted	3 Dec. 1971	TSEM75
4278	2 counted	21 Jan. 1972	TSEM75
4279	0 counted	24 Feb. 1972	TSEM75
4280	0 counted	Feb.-May 1972	TSEM75
4281	3 counted	4 June 1972	TSEM75
4282	6 counted	29 June 1972	TSEM75
4283	8 counted	30 June 1972	TSEM75
4284	12 counted	31 July 1972	TSEM75
4285	13 counted	26 Aug. 1972	TSEM75
4286	7 counted	2 Sep. 1972	TSEM75
4287	10 counted	7 Sep. 1972	TSEM75
4288	8 counted	27 Oct. 1972	TSEM75
4289	19 counted	5 Nov. 1972	TSEM75
4290	14 counted	7 Nov. 1972	TSEM75
4291	19 counted	14 Nov. 1972	TSEM75
4292	20 counted	15 Nov. 1972	TSEM75
4293	5 counted	28 Dec. 1972	TSEM75
4294	10 counted	12 Jan. 1973	TSEM75

4295	14 counted	15 Jan. 1973	TSEM75
4296	13 counted	23 Jan. 1973	TSEM75
4297	6 counted	15 Feb. 1973	TSEM75
4298	2 counted	15 Feb. 1973	TSEM75
4299	2 counted	16 Feb. 1973	TSEM75
4300	10+ counted	26 Feb. 1973	TSEM75
4301	16 counted	27 Feb. 1973	TSEM75
4302	15 counted	14 Mar. 1973	TSEM75
4303	3 counted	16 Mar. 1973	TSEM75
4304	0 counted	11 Apr. 1973	TSEM75
4305	0 counted	Mar.-Apr. 1973	TSEM75
4306	8 counted	28 Arp. 1973	TSEM75
4307	8 counted	8 May 1973	TSEM75
4308	0 counted	12 May 1973	TSEM75
4309	2 counted	17 May 1973	TSEM75
4310	7 counted	25 May 1973	TSEM75
4311	2 counted	29 May 1973	TSEM75
4312	2 counted	13 June 1973	TSEM75
4313	11 counted	10 July 1973	TSEM75
4314	HDFG: 7	8 Aug. 1973	(21)

4315	4 seen	14 Oct. 1973	SHAR74b
4316	0 seen	Aug. 1973-Jan. 1974	TSEM75
4317	HDFG: 0	15 Jan. 1974	(1)
4318	HDFG: 0	15 Jan. 1974	(21)
4319	Berger: "improvements" have already ruined Paiko Lagoon as a sanctuary for the stilt	20 May 1974	ANON74b
4320	1 counted	29 June 1974	TSEM75
4321	heard feeding	30 June 1974	TSEM75
4322	1 counted	2 July 1974	TSEM75
4323	flock flying	4 July 1974	TSEM75
4324	1 heard	21 July 1974	TSEM75
4325	0 seen	Aug. 1974	TSEM75
4326	3 counted	18 Sep. 1974	TSEM75
4327	heard feeding	19 Sep. 1974	TSEM75
4328	3 counted	25 Sep. 1974	TSEM75
4329	heard feeding	5-6 Oct. 1974	TSEM75
4330	3 counted	9 Oct. 1974	TSEM75
4331	6 counted	22 Oct. 1974	TSEM75
4332	5 counted	25 Oct. 1974	TSEM75
4333	4 counted	29 Oct. 1974	TSEM75
4334	heard feeding	30 Oct. 1974	TSEM75

4335	4 counted	8 Nov. 1974	TSEM75
4336	1 counted	11 Nov. 1974	TSEM75
4337	3 counted	19 Nov. 1974	TSEM75
4338	3 counted	25 Nov. 1974	TSEM75
4339	3 counted	27 Nov. 1974	TSEM75
4340	4 counted	11 Dec. 1974	TSEM75
4341	3 counted	4 Jan. 1975	TSEM75
4342	0 counted	Feb.-May 1975	TSEM75
4343	heard at night	21 June 1975	TSEM75
4344	heard at night	1 July 1975	TSEM75
4345	1 counted	12 July 1975	TSEM75
4346	2 counted	13 July 1975	TSEM75
4347	5 counted	19 July 1975	TSEM75
4348	5 counted	20 July 1975	TSEM75
4349	4 counted	21 July 1975	TSEM75
4350	6 counted	22 July 1975	TSEM75
4351	3 counted	23 July 1975	TSEM75
4352	2 counted	25 July 1975	TSEM75
4353	HDFG: 11	29 July 1975	(2)
4354	HDFG: 2	1 Aug. 1975	(2)

4355	3 counted	1 Aug. 1975	TSEM75
4356	1 counted	4 Aug. 1975	TSEM75
4357	2 counted	5 Aug. 1975	TSEM75
4358	7 counted	6 Aug. 1975	TSEM75
4359	7 counted	7 Aug. 1975	TSEM75
4360	HDFG: 0	25 Aug. 1975	(2)
4361	HDFG: 3	30 Sep. 1975	(2)
4362	HDFG: 8	30 Oct. 1975	(2)
4363	HDFG: 11	21 Nov. 1975	(2)
4364	HDFG: 0	29 Dec. 1975	(2)
4365	HDFG: 0	1 Jan. 1976	(2)
4366	HDFG: 0	15 Jan. 1976	(2)
4367	HDFG: 0	24 Feb. 1976	(2)
4368	HDFG: 0	31 Mar. 1976	(2)
4369	HDFG: 0	19 Apr. 1976	(2)
4370	HDFG: 0	27 May 1976	(2)
4371	HDFG: 0	29 June 1976	(2)
4372	HDFG: Stilts appear to be using the lagoon with a greater degree of regularity this year compared to last year...following an established pattern of deserting Paiko during the summer	30 July 1975 - 30 June 1976	(2)

4373	HDFG:	7	29 July 1976	(2)
4374	HDFG:	7	4, 5 Aug. 1976	(2)
4375	HDFG:	7	27 Aug. 1976	(2)
4376	HDFG:	3	27 Sep. 1976	(2)
4377	HDFG:	5	27 Sep. 1976	(2)
4378	HDFG:	3	30 Nov. 1976	(2)
4379	HDFG:	7	29 Dec. 1976	(2)
4380	HDFG:	7	13 Jan. 1976	(2)
4381	HDFG:	3	28 Jan. 1977	(2)
4382	HDFG:	0	28 Feb. 1977	(2)
4383	HDFG:	4	31 Mar. 1977	(2)
4384	HDFG:	4	26 Apr. 1977	(2)
4385	HDFG:	0	24 May 1977	(2)
4386	HDFG:	4	29 June 1977	(2)
4387	HDFG:	appears that at least 3-7 stilts are using the sanctuary with greater regularity than previously, almost year-round	1 July 1976 - 30 June 1977	(2)
4388	HDFG:	3	28 July 1977	(2)
4389	HDFG:	0	31 Aug. 1977	(2)
4390	HDFG:	3	30 Sep. 1977	(2)
4391	HDFG:	3	28 Oct. 1977	(2)

4392	HDFG: 4	28 Nov. 1977	(2)
4393	HDFG: 4	27 Dec. 1977	(2)
4394	Shallenberger: never observed more than 6 on 2 prolonged visits...and several brief counts on this study	2 June 1977 - 15 Aug. 1977	(3)
4395	HDFG: 3	12, 13 Jan. 1978	(2)
4396	HDFG: 4	27 Jan. 1978	(2)
4397	HDFG: 2	28 Feb. 1978	(2)
4398	HDFG: 4	29 Mar. 1978	(2)
4399	HDFG: 2	27 Apr. 1978	(2)
4400	HDFG: 0	30 May 1978	(2)
4401	HDFG: 3	30 June 1978	(2)
4402	HDFG: appears that from 2-4 sitlts are using the lagoon for feeding...even during the nesting season when they have usually been absent	1 July 1977 -	(2)
4403	HDFG: 4	28 July 1978	(5)
4404	HDFG: 5	28 Aug. 1978	(5)
4405	HDFG: 5	30 Sep. 1978	(5)
4406	HDFG: 4	31 Oct. 1978	(5)
4407	HDFG: 0	27 Nov. 1978	(5)
4408	HDFG: 0	27 Dec. 1978	(5)
4409	HDFG: 0	15, 16, 20 Jan. 1979	(5)
4410	HDFG: 0	30 Jan. 1979	(5)

4411	HDFG:	0	28 Feb. 1979	(5)
4412	HDFG:	0	27 Mar. 1979	(5)
4413	HDFG:	0	25 Apr. 1979	(5)
4414	HDFG:	2	31 May 1979	(5)
4415	HDFG:	2	27 June 1979	(5)
4416	HDFG:	2	31 July 1979	(5)
4417	HDFG:	2	1, 2 Aug. 1979	(5)
4418	HDFG:	3	28 Aug. 1979	(5)
4419	HDFG:	3	25 Sep. 1979	(5)
4420	HDFG:	0	29 Oct. 1979	(5)
4421	HDFG:	4	28 Nov. 1979	(5)
4422	HDFG:	0	28 Dec. 1979	(5)
4423	HDFG:	4	14-16 Jan. 1980	(5)
4424	HDFG:	2	30 Jan. 1980	(5)
4425	HDFG:	3	27 Feb. 1980	(5)
4426	HDFG:	3	31 Mar. 1980	(5)
4427	HDFG:	3	30 Apr. 1980	(5)
4428	HDFG:	4	30 May 1980	(5)
4429	HDFG:	2	30 June 1980	(5)
4430	HDFG:	2	29 July 1980	(5)

4431	HDFG:	2	27 Aug. 1980	(5)
4432	HDFG:	0	29 Sep. 1980	(5)
4433	HDFG:	3	31 Oct. 1980	(5)
4434	HDFG:	3	28 Nov. 1980	(5)
4435	HDFG:	1	29 Dec. 1980	(5)
4436	2, Christmas Count		(Dec.) 1980	PYLR81b
4437	HDFG:	1	12 Jan. 1981	(5)

Waimanalo

4438	HDFG:	35	13-15 Jan. 1970	(1)
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Island of Moloka'i

ISLANDWIDE INFERENCE

4439	HDFG:	0	14-17 Jan. 1958	(1)
4440	HDFG:	0	7-16 Jan. 1959	(1)
4441	HDFG:	1	4-8 Jan. 1960	(1)
4442	HDFG:	13	10-13 Jan. 1961	(1)
4443	HDFG:	7	15-17 Jan. 1962	(1)
4444	HDFG:	0	14-18 Jan. 1963	(1)
4445	HDFG:	9	15 Jan. 1964	(1)
4446	HDFG:	0	13-16 Jan. 1967	(1)
4447	HDFG:	0	13, 14 Jan. 1969	(1)

4448	HDFG: 0	9 Aug. 1969	(1)
4449	HDFG: classed as rare	(1969)	(7)
4450	HDFG: 0	13-15 Jan. 1970	(1)
4451	HDFG: 0	27 July 1971	(1)
4452	HDFG: 12	12 Apr. 1972	(1)
4453	HDFG: 8	8 Aug. 1973	(1)
4454	HDFG: 11	1 Aug. 1975	(2)
4455	HDFG: 13	15 Jan. 1976	(2)
4456	HDFG: 24	4, 5 Aug. 1976	(2)
4457	HDFG: 8	13 Jan. 1977	(2)
4458	HDFG: not censused	27, 28 July 1977	(2)
4459	Shallenberger: counts on Molokai are likely to... underestimate...actual population since individuals find suitable feeding habitat along the entire southern shore...mudflats, flooded pastures and silted fishponds attract this species to a wide variety of sites...count records also affected by tide...numbers found on Molokai averages less than one percent of the State population...	(1977)	(3)
4460	HDFG: 14	12, 13 Jan. 1978	(2)
4461	HDFG: 2	15, 16, 20 Jan. 1979	(5)
4462	HDFG: 32	1, 2 Aug. 1979	(5)
4463	HDFG: 18	14-16 Jan. 1980	(5)
4464	HDFG: 20	31 July, 1 Aug. 1980	(5)

4465	HDFG: 17	12-14 Jan. 1981	(5)
UNDESIGNATED LOCALITY			
4466	Wilson: collected 3 specimens	June 1888	(10)
4467	Palms: collected 4 specimens	10 February 1893	(10)
MULTIQUADRANGLE			
4468	not rare / in fish ponds along the shore	18 Jan. 1893	ROTW00
4469	small flock seen; two collected / on the beach along the way from Kaunakakai to Makakupaia	16 May 1893	(15)
4470	many / on mudflats along south side of Molokai enroute to Halawa Valley	Aug. 1964	BELJ65
4471	Banko: found none along south beaches of Molokai in search with W. Kamakana (HDFG)	7 Oct. 1966	(18)
4472	HDFG: 0 seen / East Molokai Beach area	1 Aug. 1975	(1)
4473	HDFG: 0 seen / along lee shore	12, 13 Jan. 1978	(2)
4474	HDFG: 1 seen / along shore from Kamalo to Halawa	14, 15, 20 Jan. 1979	(5)
4475	HDFG: 0 seen / lee shores		
4476	HDFG: 0 seen / from Kauanakakai to Kamalo	14, 15, 16 Jan. 1980	(5)
4477	HDFG: 0 seen / from Kamalo to Halawa	14, 15, 16 Jan. 1980	(5)
4478	HDFG: 0 seen / along lee shore	14, 15, 16 Jan. 1980	(5)

QUADRANGLE / LOCALITY

ILIO POINT

4479	Shallenberger: (N.) Pekelo reports that he has heard stilt calltin as they flew over his head at night / west end of Moloka'i	(1977)	(3)
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MOLOKAI AIRPORT

Maunaloa - Maunaloa Golf Course

4480	HDFG: 0	1 Aug. 1975	(1)
4481	HDFG: 0	14, 15, 16 Jan. 1980	(5)

Moomomi

4482	HDFG: 0	1 Aug. 1975	(1)
4483	HDFG: 0	12, 13 Jan. 1978	(2)
4484	HDFG: 0	15, 16, 20 Jan. 1979	(5)
4485	HDFG: 0	1, 2 Aug. 1979	(5)
4486	HDFG: 0	14, 15, 16 Jan. 1980	(5)

Palaau Pond - Mudflats - Pakanaka

4487	resident...young have been taken in June	1907	BRYW08
4488	2 seen	2 May 1969	PEKN70
4489	HDFG: 0	20 Aug. 1971	(12)
4490	HDFG: 0	1 Aug. 1975	(1)

4491	Shallenberger: these flat lands hold water only ephe- merally, but they still provide at least temporary feeding habitat for small numbers of stilt	(1977)	(3)
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KAUNAKAKAI

Alii Fishpond

4492	HDFG: 0	1 Aug. 1975	(1)
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Kalae

4493	HDFG: 0	1, 2 Aug. 1979	(5)
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4494	HDFG: 0	14, 15, 16 Jan. 1980	(5)
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Kaunakakai - peir Area - Sewage Pond

4495	obtained specimens of downy young	June (1887/1888)	WILS93
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4496	Perkins: collected 2 specimens	16 May 1893	(10)
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4497	saw many	3 June 1893	(15)
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4498	25+ seen (in old rice paddy east of town)	(1945)	CHIC45
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4499	HDFG: 2 (first mention of sewage pond)	8 Aug. 1973	(1)
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4500	HDFG: 5	3 Aug. 1974	(1)
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4501	HDFG: 11	1 Aug. 1975	(1)
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4502	USFWS-HDFG: 15	30 June 1976	(13)
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4503	USFWS-HDFG: 10	1 Aug. 1976	(13)
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4504	USFWS: 19	24 Aug. 1976	(13)
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4505	USFWS: 6	28 Sep. 1976	(13)
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4506	USFWS:	25	Oct. 1976	(13)
4507	USFWS:	18	3 Nov. 1976	(13)
4508	USFWS:	0	4 Nov. 1976	(13)
4509	USFWS:	9	29 Nov. 1976	(13)
4510	31		5 Dec. 1976	ZEIF77
4511	USFWS:	31	10 Dec. 1976	(13)
4512	USFWS:	14	26 Jan. 1977	(13)
4513	USFWS:	14	7 Feb. 1977	(13)
4514	USFWS:	6	15 Mar. 1977	(13)
4515	USFWS:	5	1 Apr. 1977	(13)
4516	USFWS:	3	18 Apr. 1977	(13)
4517	USFWS:	2	1 May 1977	(13)
4518	USFWS:	1	7 June 1977	(13)
4519	USFWS:	5	7 July 1977	(13)
4520	USFWS:	11	24 Aug. 1977	(13)
4521	USFWS:	10	19 Sep. 1977	(13)
4522	USFWS:	6	18 Oct. 1977	(13)
4523	USFWS:	20	8 Nov. 1977	(13)
4524	Shallenberger: observed 2 on 22 May and 5 on 6 July surveys...0 seen at other locations on the flatlands east or west of the pier		(1977)	(3)

4525	HDFG:	12	12, 13 Jan. 1978	(2)
4526	USFWS:	4	24 Jan. 1978	(13)
4527	USFWS:	27	13 Mar. 1978	(13)
4528	USFWS:	27	1, 3 Aug. 1978	(13)
4529	USFWS:	35	22 Sep. 1978	(13)
4530	USFWS:	30	17 Oct. 1978	(13)
4531	HDFG:	2	15, 16, 20 Jan. 1979	(5)
4532	USFWS:	3	30 Mar. 1979	(13)
4533	USFWS:	2	June 1979	(13)
4534	HDFG:	30	1, 2 Aug. 1979	(5)
4535	24 seen, one color banded (from Oahu)		15 Sep. 1979	PYLR81c
4536	USFWS:	23+1 banded	Sep. 1979	(13)
4537	USFWS:	6	Oct. 1979	(13)
4538	USFWS:	8	Nov. 1979	(13)
4539	USFWS:	14	24 Nov. 1979	(13)
4540	USFWS:	10	15 Dec. 1979	(13)
4541	USFWS:	4	Dec. 1979	(13)
4542	HDFG:	18	14, 15, 16 Jan. 1980	(5)
4543	USFWS:	8	Feb. 1980	(13)
4544	USFWS:	4	Mar. 1980	(13)

4545	USFWS: 6	May 1980	(13)
Kuulapuu Reservoir			
4546	HDFG: 0	1 Aug. 1975	(1)
4547	HDFG: 0	14, 15, 16 Jan. 1980	(5)
Ooia - Kaluaapuhi Fishpond - Kalamaula			
4548	classed as "rare...only 13" in 10 years of observation	(1955-1964)	PEKN64
4549	3 seen	3 Sep. 1969	PEKN70
4550	4 seen	10 Nov. 1969	PEKN70
4551	Pekelo: some use historically...not seen past few years	(28 Jan. 1972)	(12)
4552	appears to be a resident flock...13...observed for a year	(1973)	PEKN73
4553	HDFG: 6	(1973)	(1)
4554	USFWS: 0	29 Oct. 1976	(13)
4555	USFWS: 0	4 Nov. 1977	(13)
4556	USFWS: 0	15 Mar. 1977	(13)
4557	USFWS: 0	7 July 1977	(13)
4558	USFWS: 0	24 Aug. 1977	(13)
4559	USFWS: 0	19 Sep. 1977	(13)
4560	USFWS: 0	18 Oct. 1977	(13)
4561	USFWS: 0	8 Nov. 1977	(13)

4562	Shallenberger: little suitable habitat for stilt but they continue to appear irregularly in low numbers ...several recent USFWS surveys have not found this species at this site (Kaluaapuhi Fishpond)	(1977)	(3)
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4563	HDFG: 0	14, 15, 16 Jan. 1980	(5)
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KAMALO

Kakahaia National Wildlife Refuge

4564	USFWS: 8 (Kawela?)	(1966?)	(12)
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4565	HDFG: 18	7 Aug. 1970	(1)
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4566	Banko: N. Carlson counted 27	21 Oct. 1970	(18)
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4567	USFWS: 2	20 Aug. 1971	(12)
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4568	several noted on early USFWS visits...but none since	(1970-1972)	COLR77
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4569	HDFG: 0	1 Aug. 1975	(1)
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4570	USFWS: 0	10 Feb. 1976	(13)
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4571	USFWS: 0	9 Mar. 1976	(13)
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4572	USFWS: 0	19 Apr. 1976	(13)
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4573	USFWS: 0	7 May 1976	(13)
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4574	USFWS: 0	8 June 1976	(13)
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4575	USFWS: 0	20 June 1976	(13)
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4576	USFWS: 0	30 June 1976	(13)
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4577	USFWS: 0	4 Aug. 1976	(13)
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4578	USFWS: 0	24 Aug. 1976	(13)
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4579	USFWS:	0	3 Nov. 1976	(13)
4580	USFWS:	0	4 Nov. 1976	(13)
4581	USFWS:	0	29 Nov. 1976	(13)
4582	USFWS:	0	10 Dec. 1976	(13)
4583	USFWS:	0	26 Jan. 1976	(13)
4584	USFWS:	0	7 Feb. 1977	(13)
4585	USFWS:	0	15 Mar. 1977	(13)
4586	USFWS:	0	1 Apr. 1977	(13)
4587	USFWS:	0	3 May 1977	(13)
4588	USFWS:	0	30 May 1977	(13)
4589	USFWS:	0	7 June 1977	(13)
4590	USFWS:	0	1 July 1977	(13)
4591	USFWS:	0	7 July 1977	(13)
4592	USFWS:	0	24 Aug. 1977	(13)
4593	USFWS:	0	19 Sep. 1977	(13)
4594	USFWS:	0	18 Oct. 1977	(13)
4595	USFWS:	0	8 Nov. 1977	(13)
4596	USFWS:	0	24 Jan. 1978	(13)
4597	USFWS:	0	13 Mar. 1978	(13)
4598	USFWS:	0	13 June 1978	(13)

4599	USFWS:	0	14 July 1978	(13)
4600	USFWS:	0	22 Sep. 1978	(13)
4601	USFWS:	0	24 Nov. 1978	(13)
4602	USFWS:	0	15 Dec. 1978	(13)
4603	USFWS:	0	19 Jan. 1979	(13)
4604	HDFG:	0 (Kawela)	15, 16, 20 Jan. 1979	(5)
4605	USFWS:	0	23 Feb. 1979	(13)
4606	USFWS:	0	30 Mar. 1979	(13)
4607	HDFG:	1	1, 2 Aug. 1979	(5)
4608	4 seen		15 Sep. 1979	PYLR81c
4609	USFWS:	8, ave. daily use	Oct.-Dec. 1979	(13)
4610	HDFG:	0	14, 15, 16 Jan. 1980	(5)
4611	USFWS:	0, ave. daily use	Jan.-Mar. 1980	(13)
4612	USFWS:	0, ave. daily use	Apr.-June 1980	(13)
4613	USFWS:	0, ave. daily use	July-Sep. 1980	(13)
4614	USFWS:	5, ave. daily use	Oct.-Dec. 1980	(13)
4615	USFWS:	3, ave. daily use	Jan.-Mar. 1981	(13)
4616	USFWS:	0, ave. daily use	Apr.-June 1981	(13)
4617	USFWS:	0, ave. daily use	July-Sep. 1981	(13)
4618	USFWS:	0, ave. daily use	16 Dec.'81-15 Jan.'82	(13)

Kamalo

4619	Shallenberger: 2	20 May 1977	(3)
4620	HDFG: 0	15, 16, 20 Jan. 1979	(5)

Ualapue Pond

4621	HDFG: 2	12, 13 Jan. 1978	(2)
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HALAWA

Halawa

4622	HDFG: 0	12, 13 Jan. 1978	(2)
4623	HDFG: 0	15, 16, 20 Jan. 1979	(5)

Island of Lana'i

4624	2 landed...remained 10 minutes before taking off... runway had many puddles of standing water...this could well be first report of the species on that island / runway at Airport	1 June 1980	PYLR81a
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Island of Maui

ISLANDWIDE

4625	HDFG: 190	1-31 Jan. 1957	(1)
4626	HDFG: 159	14-17 Jan. 1958	(1)
4627	HDFG: 211	7-16 Jan. 1959	(1)
4628	HDFG: 232	4-8 Jan. 1960	(1)
4629	HDFG: 155	10-13 Jan. 1961	(1)

4630	HDFG:	282	15-17 Jan. 1962	(1)
4631	HDFG:	170	14-18 Jan. 1963	(1)
4632	HDFG:	164	15 Jan. 1964	(1)
4633	HDFG:	162	14 Jan. 1965	(1)
4634	HDFG:	253	13, 14 Jan. 1966	(1)
4635	HDFG:	188	13-16 Jan. 1967	(1)
4636	HDFG:	226	8-10 Jan. 1968	(1)
4637	HDFG:	611	24 July 1968	(1)
4638	HDFG:	171	13-14 Jan. 1969	(1)
4639	HDFG:	440	24 July 1969	(1)
4640	HDFG:	officially classed as rare	(1969)	(7)
4641	HDFG:	207	13-15 Jan. 1970	(1)
4642	HDFG:	469	7 Aug. 1970	(1)
4643	HDFG:	426	27 July 1971	(1)
4644	HDFG:	419	12 Apr. 1972	(1)
4645	HDFG:	216+ (inc. count)	8 Aug. 1973	(1)
4646	HDFG:	391	19 Sep. 1973	(1)
4647	HDFG:	523	1 Aug. 1975	(2)
4648	HDFG:	335	16 Jan. 1976	(2)
4649	HDFG:	137	27, 28 July 1977	(3)

4650	Shallenberger: over a 20 year period...Maui population has averaged nearly 40% of the Statewide total...for the most part counts on Maui have not fluctuated as widely as on other islands...reflecting, at least in part, lack of major habitat change in Kanaha or Kealia Ponds...as on all islands, summer counts are generally higher than winter counts, reflecting the recruitment of young into the population	(1977)	(3)
4651	HDFG: 159	12, 13 Jan. 1978	(2)
4652	HDFG: 154	15, 16, 20 Jan. 1979	(5)
4653	HDFG: 333	1, 2 Aug. 1979	(5)
4654	HDFG: 238	14-16 Jan. 1980	(5)
4655	HDFG: 234	31 July, 1 Aug. 1980	(5)
4656	HDFG: 410	12-14 Jan. 1981	(5)

UNDESIGNATED LOCALITIES

Plantation Irrigation Reservoirs (Mostly in WAILUKU & PAIA quads)

4657	26 in No. 10 Reservoir	(?Nov. 1948)	MUNG49a
4658	HDFG: 25	14-17 Jan. 1958	(1)
4659	HDFG: 42	7-16 Jan. 1959	(1)
4660	HDFG: 53	4-8 Jan. 1960	(1)
4661	HDFG: 6	10-13 Jan. 1961	(1)
4662	HDFG: 2	15-17 Jan. 1962	(1)
4663	HDFG: 71	14-18 Jan. 1963	(1)

4664	HDFG:	27	15 Jan. 1964	(1)
4665	HDFG:	0	14 Jan. 1965	(1)
4666	HDFG:	28	13, 14 Jan. 1966	(1)
4667	USFWS: HDFG:	16	6 Oct. 1966	(18)
4668	HDFG:	8	13-16 Jan. 1967	(1)
4669	HDFG:	17	8-10 Jan. 1968	(1)
4670	HDFG:	52	24 July 1968	(1)
4671	HDFG:	2	13, 14 Jan. 1969	(1)
4672	HDFG:	0	24 July 1969	(1)
4673	HDFG:	6	7 Aug. 1970	(1)
4674	HDFG:	166	27 July 1971	(1)
4675	HDFG:	8	12 Apr. 1972	(1)
4676	HDFG:	65	19 Sep. 1973	(1)
4677	HDFG:	35	1 Aug. 1974	(1)
4678	HDFG:	25	31 July 1975	(1)
4679	HDFG:	52	15 Jan. 1976	(2)
4680	HDFG:	16	4, 5 Aug. 1976	(2)
4681	HDFG:	0	13 Jan. 1977	(2)
4682	HDFG:	2	27, 28 July 1977	(2)
4683	HDFG:	74	12, 13 Jan. 1978	(2)

4684	HDFG: 9	27, 28, 30 July 1978	(5)
4685	HDFG: 0	15, 16, 20 Jan. 1979	(5)
4686	HDFG: 19	1, 2, Aug. 1979	(5)
4687	HDFG: 9	14, 15, 16 Jan. 1980	(5)

MULTIQUADRANGLE

4688	present / Baldwin Park to Kahului and return	20 Aug. 1971	HANR75
4689	present / Baldwin Park to Kahului and Hookipa Park	22 Aug. 1971	HANR75
4690	present / Seven Sacred Pools to Kahului and Kihei	25 Aug. 1971	HANR75
4691	9, Christmas Count / Coastline and Kihei Residential	31 Dec. 1979	KEPK80

LAHAINA

Wahikuli

4692	Shallenberger: 1 seen...workers confirm that stilt were seen with some regularity / Wahikuli mudflat, Crater Reservoir, Wahikuli Reservoir	(1977)	(3)
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WAILUKU

Kanaha Pond

4693	observed (lagoon of Kahului)	June-July 1879	FINO80
4694	must be 100	23 Jan. 1949	CHIC49a
4695	common	7 July-11 Sep. 1951	BONH51
4696	on the increase	(1953)	BALH53
4697	observed	30 Apr; 1,3 May 1957	CURA58

4698	HDFG: 58	14-17 Jan. 1958	(1)
4699	considerable numbers	23 Mar.-14 Apr. 1958	EASW58
4700	observed	Dec. 1958	CUSS59
4701	observed	Jan. 1959	CUSS59
4702	HDFG: 35	7-16 Jan. 1959	(1)
4703	observed	Feb. 1959	CUSS59
4704	HDFG: 179	4-8 Jan. 1960	(1)
4705	several seen...evidently nesting	Easter (1960)	HANC60b
4706	some 50	Apr. 1960	HILN60
4707	several hundred seem to be in residence...difficult to census	(1961)	STEE61
4708	HDFG: 134	10-13 Jan. 1961	(1)
4709	scores	Oct. 1961	MARA62
4710	HDFG: 276	15-17 Jan. 1962	(1)
4711	ca. 50	Feb. 1962	CURH63
4712	HDFG: 99	14-18 Jan. 1963	(1)
4713	seen	July-Aug. 1963	YOCC68
4714	HDFG: 115	15 Jan. 1964	(1)
4715	USFWS: 101	6 May 1964	(12)
4716	USFWS: 100	22 May 1964	(12)
4717	155 censused	14 Dec. 1964	KRIE65a

4718	150 censused	11 Jan. 1965	KRIE65a
4719	150 (censused)	12 Jan. 1965	KRIE65b
4720	HDFG: 155	14 Jan. 1965	(1)
4721	117 (censused)	5 Feb. 1965	KRIE65b
4722	144 (censused)	5 Mar. 1965	KRIE65b
4723	217 (censused)	28 Apr. 1965	KRIE65b
4724	156 (censused)	21 July 1965	KRIE65b
4725	211 censused	28 Oct. 1965	KRIE66a
4726	171 censused	18 Nov. 1965	KRIE66a
4727	USFWS: 155	14 Dec. 1965	(12)
4728	HDFG: 200	13, 14 Jan. 1966	(1)
4729	451 censused	13 July 1966	KRIE66b
4730	200 seen	24 July 1966	WOOP66
4731	475 censused	11 Aug. 1966	KRIE66b
4732	Banko: 232, 256 in replicate counts	6 Oct. 1966	(18)
4733	seen in most of the ponds	16-23 Nov. 1966	ORDW67
4734	USFWS: 22 counts by State & federal biologists average 182; range 35-475	(1961-1966)	(11)
4735	HDFG: 170	13-16 Jan. 1967	(1)
4736	USFWS: 77	6 Oct. 1967	(12)

4737	172 censused	23 Nov. 1967	KRIE67
4738	ca. 50	30 Dec. 1967	ORER68
4739	HDFG: 201	8-10 Jan. 1968	(1)
4740	several	(31 Mar. 1968)	KEIG68
4741	USFWS: 174 + at least 3 nests	21 Apr. 1968	(12)
4742	USFWS: 188, incl. 3 young + 6 nests	24 June 1968	(12)
4743	HDFG: 558 captured and dyed 48	21-29 Oct. 1968	(1)
4744	captured and dyed 48	21-29 Oct. 1968	SINJ69
4745	49 banded and dyed last week	28 Nov. 1968	ANON69b
4746	many	29 Dec. 1968	MCNJ69
4747	many	30 Dec. 1968	DONW68a
4748	HDFG: 107	13, 14 Jan. 1969	(1)
4749	HDFG: 260	24 July 1969	(1)
4750	USFWS: 223	23 Nov. 1969	(12)
4751	HDFG: 207	13-15 Jan. 1970	(1)
4752	296 censused	7 Apr. 1970	KAIC70b
4753	231 censused	10 June 1970	KINW71
4754	304 censused	13 June 1970	KINW71
4755	195 censused	19 June 1970	KINW71
4756	208 censused	26 June 1970	KINW71

4757	240 censused incl. 11 immatures	3 July 1970	KINW71
4758	209 censused, incl. 5 immatures	8 July 1970	KINW71
4759	146 censused, incl. 8 immatures	15 July 1970	KINW71
4760	102 censused, incl. 5 immatures	21 July 1970	KINW71
4761	251 censused, incl. 7 immatures	25 July 1970	KINW71
4762	441, 498, 463, 487 censused in replicate counts	1 Aug. 1970	KINW71
4763	HDFG: 463	7 Aug. 1970	(1)
4764	USFWS: 498 incl. 4 immatures	13 Aug. 1970	(12)
4765	USFWS: 441 incl. 7 immatures	19 Aug. 1970	(12)
4766	USFWS: 413	8 Sep. 1970	(12)
4767	USFWS: 472	17 Sep. 1970	(12)
4768	USFWS: 375	24 Sep. 1970	(12)
4769	USFWS: 383	1 Oct. 1970	(12)
4770	USFWS: 442	8 Oct. 1970	(12)
4771	USFWS: 426	15 Oct. 1970	(12)
4772	USFWS: 295	22 Oct. 1970	(12)
4773	USFWS: 255	29 Oct. 1970	(12)
4774	USFWS: 275	5 Nov. 1970	(12)
4775	USFWS: 309	12 Nov. 1970	(12)
4776	USFWS: 216	19 Nov. 1970	(12)

4777	USFWS: 209	27 Nov. 1970	(12)
4778	at least 20	(6-11 May 1971)	SMIS71
4779	present	(2 June 1971)	STRC71
4780	HDFG: 255	27 July 1971	(1)
4781	present	19 Aug. 1971	HANR75
4782	recorded 150	20 Aug. 1971	HANR75
4783	present	27 Aug. 1971	HANR75
4784	HDFG: 255	12 Apr. 1972	(1)
4785	found 3 young with 2 adults	4 July 1972	BERA73
4786	3 2-egg nests; 1 active, 2 inactive	5 July 1972	BERA73
4787	71 max. number censused	4-7 July 1972	BERA73
4788	84 max. number censused	6-9 Aug. 1972	BERA73
4789	228 (censused)	21 Aug. 1972	BERA73
4790	168 max. number censused	21 Aug. 1972	BERA73
4791	293 max. number censused	13-15 Sep. 1972	BERA73
4792	297 counted...several vantage points	23 Feb. 1973	MULM73b
4793	242 censused	18 Apr. 1973	KRIE73b
4794	HDFG: 231	19 Sep. 1973	(1)
4795	HDFG: 272	1 Aug. 1974	(1)
4796	present	19 Jan. 1975	UDVM75

4797	fewer present than 2 years ago	May, June 1975	STRC75
4798	HDFG: 77	31 July 1975	(1)
4799	HDFG: 77	1 Aug. 1975	(2)
4800	HDFG: of 77 age-classified, 69 were adults and 8 were young	Aug. 1975	(19)
4801	HDFG: 61	14 Nov. 1975	(2)
4802	HDFG: 137	15 Jan. 1976	(2)
4803	HDFG: 117, monthly high count	Mar. 1976	(19)
4804	HDFG: 176	6 Apr. 1976	(2)
4805	HDFG: 207, monthly high count	Apr. 1976	(19)
4806	HDFG: 206, monthly high count	May 1976	(19)
4807	HDFG: 237, monthly high count	June 1976	(19)
4808	HDFG: 45 nests found...85.6 percent with eggs...88.1 percent hatching success	1 July 1975 - 30 June 1976	(19)
4809	HDFG: 105	4,5 Aug. 1976	(2)
4810	USFWS: 61 inc. 1 chick and 1 nest	24, 25 Aug. 1976	(13)
4811	USFWS: 31	28 Sep. 1976	(13)
4812	USFWS: 340+	11 Oct. 1976	(13)
4813	USFWS; 43	4 Nov. 1976	(13)
4814	USFWS: 102	30 Nov. 1976	(13)
4815	HDFG: 65	13 Jan. 1977	(2)

4816	USFWS:	64	27 Jan. 1977	(13)
4817	USFWS:	301	7 Feb. 1977	(13)
4818	USFWS:	65	15 Mar. 1977	(13)
4819	HDFG:	135	5 Apr. 1977	(2)
4820	USFWS:	141	18 Apr. 1977	(13)
4821	Shallenberger:	191 max. number counted	13 May 1977	(3)
4822	USFWS:	103	7 June 1977	(13)
4823	USFWS:	47	7 July 1977	(13)
4824	Shallenberger:	55, incl. chicks of 3 broods	7 July 1977	(3)
4825	HDFG:	47	27, 28 July 1977	(2)
4826	USFWS:	49	23 Aug. 1977	(13)
4827	HDFG:	47	Aug. 1977	(2)
4828	USFWS:	42	19 Sep. 1977	(13)
4829	USFWS:	21	19 Oct. 1977	(13)
4830	USFWS:	75	7 Nov. 1977	(13)
4831	USFWS:	69	9 Nov. 1977	(13)
4832	USFWS:	57	10 Nov. 1977	(13)
4833	USFWS:	113	29 Nov. 1977	(13)
4834	HDFG:	78	Nov. 1977	(2)
4835	USFWS:	163	23 Dec. 1977	(13)

4836	USFWS: 122	10 Jan. 1978	(13)
4837	HDFG: 57	12, 13 Jan. 1978	(2)
4838	USFWS: 129	30 Jan. 1978	(13)
4839	USFWS: 165	27 Feb. 1978	(13)
4840	HDFG: 124	Feb. 1978	(2)
4841	USFWS: 105	13 Mar. 1978	(13)
4842	USFWS: 174	20 Mar. 1978	(13)
4843	HDFG: 169	Mar. 1978	(2)
4844	USFWS: 135	14 Apr. 1978	(13)
4845	HDFG: 196	Apr. 1978	(2)
4846	HDFG: 173	May 1978	(2)
4847	HDFG: 142	June 1978	(2)
4848	HDFG: onset of breeding season was the cause of the noticeable increase after February	1 July 1977 - 30 June 1978	(2)
4849	HDFG: 69 nests located...55 (80%) nests with complete clutches (2 or more eggs) held 217 eggs...78% hatching success...88% fertility rate...average incubation period of 7 nest sample was 26.1 days...of 14 nests with incomplete clutches 5 had only 1 egg each and 9 nests contained no eggs during the observation period ...4 nests, all on islands contained complete clutches twice, all hatched successfully except for 1 fully developed chick found destroyed in the egg...13 complete clutches were found destroyed...5 eggs were of incomplete clutches and were recorded as dropped in different nests, and 10 eggs were found dropped at random	1 July 1977 - 30 June 1978	(43)

4850	HDFG:	142	28 July 1978	(5)
4851	HDFG:	180	28 Aug. 1978	(5)
4852	HDFG:	154	19 Sep. 1978	(5)
4853	USFWS:	108	17 Oct. 1978	(13)
4854	HDFG:	130	31 Oct. 1978	(5)
4855	HDFG:	159	29 Nov. 1978	(5)
4856	HDFG:	129	29 Dec. 1978	(5)
4857	HDFG:	125, monthly high count	15 Jan. 1979	(9)
4858	HDFG:	78, monthly high count	27 Feb. 1979	(9)
4859	HDFG:	127, monthly high count	27 Mar. 1979	(9)
4860	HDFG:	152, mothly high count	20 Apr. 1979	(9)
4861	HDFG:	141, monthly high count	31 May 1979	(9)
4862	HDFG:	165, monthly high count	30 June 1979	(9)
4863	HDFG:	206, monthly high count	30 July 1979	(9)
4864	HDFG:	198, monthly high count	1 Aug. 1979	(9)
4865	HDFG:	103 nests found...88 with complete clutches... 75% hatching success	(Apr.- Aug. 1979)	(9)
4866	HDFG:	184	18 Sep. 1979	(5)
4867	HDFG:	246	29 Oct. 1979	(5)
4868	HDFG:	201	29 Nov. 1979	(5)
4869	HDFG:	131	31 Dec. 1979	(5)

4870	HDFG: 122	15 Jan. 1980	(5)
4871	HDFG: 88	Feb. 1980	(5)
4872	HDFG: 43	Mar. 1980	(5)
4873	HDFG: 202	Apr. 1980	(5)
4874	HDFG: 215	May 1980	(5)
4875	HDFG: 176	June 1980	(5)
4876	HDFG: 47 nests located...on only 30 of 116 constructed islands...35 nests (75%) recorded with complete clutches(containing 2 or more eggs) held total of 131 eggs...122 (93%) of 131 hatching...94% fertility...1 nest site used twice and 2 islands held 2 nests each, all with complete clutches...monthly counts of adults ranged from 43-215 during the breeding season...40 juveniles counted during the 1980 August waterbird survey / Kanaha Pond...survey conducted only in the constructed island area	1 July 1979 - 30 June 1980	(44)
4877	HDFG: 189	July 1980	(5)
4878	HDFG: 143	Aug. 1980	(5)
4879	HDFG: total of 41 nests found during breeding season	Aug. 1980	(5)
4880	HDFG: 146	Sep. 1980	(5)
4881	HDFG: 156	Oct. 1980	(5)
4882	HDFG: 121	Nov. 1980	(5)
4883	HDFG: 107	Dec. 1980	(5)
4884	HDFG: 64	Jan. 1981	(5)

4885	HDFG: 6 new nesting islets constructed...2 were used successfully	Oct. 1980-Sep. 1981	(47)
Waihee			
4886	Shallenberger: stilt present prior to filling and planting of cane / Waihee Marshland	(1977)	(3)
MAALAEA			
Kealia Pond			
4887	HDFG: 76	14-17 Jan. 1958	(1)
4888	HDFG: 134	7-16 Jan. 1959	(1)
4889	observed	Feb. 1959	CUSS59
4890	HDFG: 0	4-8 Jan. 1960	(1)
4891	HDFG: 15	10-13 Jan. 1961	(1)
4892	HDFG: 4	15-17 Jan. 1962	(1)
4893	HDFG: 22	15 Jan. 1964	(1)
4894	USFWS: 35	May 1964	(12)
4895	30 censused	14 Dec. 1964	KRIE65a
4896	HDFG: 7	14 Jan. 1965	(1)
4897	149 censused	22 July 1965	KRIE65b
4898	581 censused	1 Nov. 1965	KRIE66a
4899	22 censused	18 Nov. 1965	KRIE66a
4900	USFWS: 57	23 Nov. 1965	(12)

4901	USFWS: 30	14 Dec. 1965	(12)
4902	HDFG: 25	13, 14 Jan. 1966	(1)
4903	Banko: 29	2 Apr. 1966	(18)
4904	0 (dry)	13 July, 11 Aug. 1966	KRIE66b
4905	Banko: 0 (dry)	6 Oct. 1966	(18)
4906	USFWS: 11 counted range from 4-134, ave. 30 seen; no evidence of nesting observed	1958-1966	(17)
4907	HDFG: 10	13-16 Jan. 1967	(1)
4908	USFWS: 135	6 Oct. 1967	(12)
4909	57 censused	23 Nov. 1967	KRIE67
4910	HDFG: 8	8-10 Jan. 1968	(1)
4911	USFWS: 113	24 June 1968	(12)
4912	HDFG: 1 (nearly dry)	24 July 1968	(1)
4913	HDFG: 62	13, 14 Jan. 1969	(1)
4914	HDFG: 180	24 July 1969	(1)
4915	USFWS: 82	21 Nov. 1969	(12)
4916	USFWS: 82	23 Nov. 1969	(12)
4917	HDFG: 0	13-15 Jan. 1970	(1)
4918	USFWS: 36	25 Feb. 1970	(12)
4919	USFWS: 36	27 Feb. 1970	(12)
4920	120 censused	6 Apr. 1970	KAIC70b

4921	48 censused	10 June 1970	KINW71
4922	57 censused	13 June 1970	KINW71
4923	49 censused	19 June 1970	KINW71
4924	123 censused	26 June 1970	KINW71
4925	102 censused	3 July 1970	KINW71
4926	147 censused	8 July 1970	KINW71
4927	262 censused	15 July 1970	KINW71
4928	326 censused	21 July 1970	KINW71
4929	217 censused	25 July 1970	KINW71
4930	69 censused	1 Aug. 1970	KINW71
4931	HDFG: 0 (dry)	7 Aug. 1970	(1)
4932	0 (dry)	7 Aug. 1970	KINW71
4933	0 (dry)	13 Aug. 1970	KINW71
4934	0 (dry)	19 Aug. 1970	KINW71
4935	0 (dry)	24 Aug. 1970	KINW71
4936	USFWS: 31	12 Nov. 1970	(12)
4937	USFWS: 158	19 Nov. 1970	(12)
4938	USFWS: 2	27 Nov. 1970	(12)
4939	HDFG: 5	27 July 1971	(1)
4940	HDFG: 156	12 Apr. 1972	(1)

4941	1 4-egg nest found	5 July 1972	BERA73
4942	104 counted	21 Aug. 1972	BERA73
4943	HDFG: 95	19 Sep. 1973	(1)
4944	HDFG: 245	1 Aug. 1974	(1)
4945	80+	18, 19 Jan. 1975	UDVM75
4946	HDFG: 421	31 July 1975	(1)
4947	HDFG: 421	1 Aug. 1975	(2)
4948	USFWS: 75	12 Nov. 1975	(13)
4949	HDFG: 146	15 Jan. 1976	(2)
4950	USFWS: 66	10 Feb. 1976	(13)
4951	USFWS: 66	11 Feb. 1976	(13)
4952	USFWS: 51	3 Mar. 1976	(13)
4953	USFWS: 41	4 Mar. 1976	(13)
4954	USFWS: 22	5 Mar. 1976	(13)
4955	USFWS: 35	8 Mar. 1976	(13)
4956	USFWS: 22	9 Mar. 1976	(13)
4957	USFWS: 9+	Mar. 1976	(13)
4958	HDFG: 87, monthly high count	Mar. 1976	(19)
4959	HDFG: 50, monthly high count	Apr. 1976	(19)
4960	USFWS: 8	7 May 1976	(13)

4961	USFWS:	31	8 May 1976	(13)
4962	HDFG:	33, monthly high count	May 1976	(19)
4963	USFWS:	18	9 June 1976	(13)
4964	HDFG:	27, monthly high count	June 1976	(19)
4965	HDFG:	9 nests found...84.6 % hatching success	1 July 1975 - 30 June 1976	(19)
4966	USFWS:	100	20 July 1976	(13)
4967	HDFG:	139, monthly high count	July 1976	(19)
4968	USFWS:	182	4 Aug. 1976	(19)
4969	USFWS:	199	24 Aug. 1976	(19)
4970	USFWS:	206	25 Aug. 1976	(19)
4971	HDFG:	184, monthly high count	Aug. 1976	(19)
4972	USFWS:	272	28 Sep. 1976	(13)
4973	USFWS:	291	29 Sep. 1976	(13)
4974	USFWS:	75+	11 Oct. 1976	(13)
4975	USFWS:	316	5 Nov. 1976	(13)
4976	USFWS:	177	5 Dec. 1976	(13)
4977	HDFG:	269	13 Jan. 1977	(2)
4978	USFWS:	355	27 Jan. 1977	(13)
4979	USFWS:	16	8 Feb. 1977	(13)

4980	USFWS:	276	15 Mar. 1977	(13)
4981	USFWS:	276	16 Mar. 1977	(13)
4982	HDFG:	18	18 Apr. 1977	(2)
4983	USFWS:	32 (7 in Fish Farm)	19 Apr. 1977	(13)
4984	Shallenberger:	116	14 May 1977	(3)
4985	USFWS:	65	7 June 1977	(13)
4986	USFWS:	112 (7 in Fish Farm)	8 June 1977	(13)
4987	USFWS:	175	7 July 1977	(13)
4988	Shallenberger:	213	8 July 1977	(3)
4989	USFWS:	213 (2 in Fish Farm)	8 July 1977	(13)
4990	HDFG:	88	27, 28 July 1977	(2)
4991	USFWS:	149	23 Aug. 1977	(13)
4992	USFWS:	172 (10 in Fish Farm)	24 Aug. 1977	(13)
4993	USFWS:	296	19 Sep. 1977	(13)
4994	USFWS:	295 (+4 in Fish Farm)	20 Sep. 1977	(13)
4995	USFWS:	326	18 Oct. 1977	(13)
4996	USFWS:	427 (1 in Fish Farm)	29 Oct. 1977	(13)
4997	USFWS:	247	7 Nov. 1977	(13)
4998	USFWS:	201	8 Nov. 1977	(13)
4999	USFWS:	30 (+2 in Fish Farm)	9 Nov. 1977	(13)

5000	USFWS:	230	28 Nov. 1977	(13)
5001	USFWS:	177	1 Dec. 1977	(2)
5002	USFWS:	42	23 Dec. 1977	(13)
5003	USFWS:	46	10 Jan. 1978	(13)
5004	HDFG:	28	12, 13 Jan. 1978	(2)
5005	USFWS:	69	30 Jan. 1978	(13)
5006	USFWS:	37	27 Feb. 1978	(13)
5007	USFWS:	11	14 Mar. 1978	(13)
5008	USFWS:	9	20 Mar. 1978	(13)
5009	USFWS:	20	14 Apr. 1978	(13)
5010	HDFG:	1 3-egg nest found...hatched successfully	1 July '77-30 June '78	(43)
5011	HDFG:	35	27, 28, 30 July 1978	(5)
5012	USFWS:	38	17 Oct. 1978	(13)
5013		76, Christmas Count	23 Dec. 1978	WALJ79
5014	HDFG:	26	15, 16, 20 Jan. 1979	(5)
5015	HDFG:	24, monthly high count	Mar. 1979	(9)
5016	HDFG:	41, mothly high count	Apr. 1979	(9)
5017	HDFG:	50, monthly high count	May 1979	(9)
5018	HDFG:	26, monthly high count	June 1979	(9)
5019	HDFG:	131, monthly high count	July 1979	(9)

5020	HDFG: 116, monthly high count	Aug. 1979	(9)
5021	HDFG: no nests found but several broods seen	Apr.- Aug. 1979	(9)
5022	82, Christmas Count	31 Dec. 1979	KEPK80
5023	HDFG: 107	14, 15, 20 Jan. 1980	(5)
5024	HDFG: 60	Feb. 1980	(5)
5025	HDFG: 24	Mar. 1980	(5)
5026	HDFG: 36	Apr. 1980	(5)
5027	HDFG: 47	May 1980	(5)
5028	HDFG: 14	June 1980	(5)
5029	HDFG: 33	July 1980	(5)
5030	HDFG: 43	Aug. 1980	(5)
5031	HDFG: 204	Sep. 1980	(5)
5032	HDFG: 87	Oct. 1980	(5)
5033	HDFG: 173	Nov. 1980	(5)
5034	HDFG: 167	Dec. 1980	(5)
5035	HDFG: 288...gradual filling of the pond during the winter probably creates more feeding areas	12 Jan. 1981	(5)

Island of Hawai'i

ISLANDWIDE

5036	HDFG: 0 14-17 Jan. 1958 (1)		
5037	HDFG: 1	10-13 Ja. 1961	(1)

5038	HDFG:	0	15-17 Jan. 1962	(1)
5039	HDFG:	11	14-18 Jan. 1963	(1)
5040	HDFG:	21	15 Jan. 1964	(1)
5041	HDFG:	27	14 Jan. 1965	(1)
5042	HDFG:	28	13, 14 Jan. 1966	(1)
5043	HDFG:	19	13-16 Jan. 1967	(1)
5044	HDFG:	38	8-10 Jan. 1968	(1)
5045	HDFG:	19	24 July 1968	(1)
5046	HDFG:	35	13 Jan. 1969	(2)
5047	HDFG:	24	24 July 1969	(2)
5048	HDFG:	classed as rare	(1969)	(7)
5049	HDFG:	24	15 Jan. 1970	(2)
5050	HDFG:	27	7 Aug. 1970	(5)
5051	HDFG:	27	12 Jan. 1971	(2)
5052	HDFG:	19	27 July 1971	(2)
5053	HDFG:	27	13 Jan. 1972	(2)
5054	HDFG:	20	12 Apr. 1972	(1)
5055	HDFG:	16	3 Aug. 1972	(2)
5056	HDFG:	24	18 Jan. 1973	(2)
5057	HDFG:	28	21 June 1973	(2)

5058	HDFG: 17	8 Aug. 1973	(2)
5059	HDFG: 20	15 Jan. 1974	(2)
5060	HDFG: 22	1 Aug. 1974	(2)
5061	HDFG: 16	23 Jan. 1975	(2)
5062	HDFG: 17	1 Aug. 1975	(2)
5063	HDFG: 22	15 Jan. 1976	(2)
5064	HDFG: Habitat conditions in most areas continuing to deteriorate due to increased human activity - illegal shooting, disturbance, clearing of pond edges and drainage...reduced value to waterbirds	1 July 1975 - 30 June 1976	(2)
5065	HDFG: 15	4 Aug. 1976	(5)
5066	HDFG: 18	13 Jan. 1977	(5)
5067	HDFG: 26	27, 28 July 1977	(2)
5068	Shallenberger: population has never exceeded 10% of the Statewide count and averages less than 3%	(1977)	(3)
5069	HDFG: 11	12 Jan. 1978	(5)
5070	HDFG: 22	28 July 1978	(5)
5071	HDFG: 22	15 Jan. 1979	(5)
5072	HDFG: 18	1 Aug. 1979	(5)
5073	HDFG: 25	14 Jan. 1980	(5)
5074	HDFG: 20	31 July, 1 Aug. 1980	(5)
5075	HDFG: 20	12-14 Jan. 1981	(5)

UNDESIGNATED LOCALITY

5076	Banko: Wilson collected 3 specimens	1888?/1896?	(10)
5077	Banko: Collett possibly collected 1 specimen on island of Hawaii	(ca. 1893?)	(10)

MULTIQUADRANGLE

5078	Shallenberger: an estimated 20-30 regularly inhabit Kona Coast ponds, principally Aimakapa and Opaepala, although some have been seen at higher elevation cattle reservoirs as well...counts at Aimakapa and Kaloko Fishponds on 7, 8, 24 June and 8 July ranged from 4-7...no nests located	(1977)	(3)
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QUADRANGLE / LOCALITY

Kohala District

HAWI

Kehena Reservoir

5079	HDFG: 0	1 Aug. 1975	(1)
5080	HDFG: 0	15 Jan. 1976	(2)
5081	HDFG: 0	4, 5 Aug. 1976	(2)
5082	HDFG: 0	13 Jan. 1977	(2)
5083	HDFG: 0	27, 28 July 1977	(2)
5084	HDFG: 0	12, 13 Jan. 1978	(2)
5085	HDFG: 0	15, 16, 20 Jan. 1979	(5)
5086	HDFG: 0	1, 2 Aug. 1979	(5)

5087	HDFG:	0	14, 15, 16 Jan. 1980	(5)
5088	HDFG:	0	31 July, 1 Aug. 1980	(5)

Puu Okomau

5089	HDFG:	0	1 Aug. 1975	(1)
5090	HDFG:	0	15 Jan. 1976	(2)
5091	HDFG:	0	4, 5 Aug. 1976	(2)
5092	HDFG:	0	13 Jan. 1977	(2)
5093	HDFG:	0	27, 28 July 1977	(2)
5094	HDFG:	0	12, 13 Jan. 1978	(2)
5095	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5096	HDFG:	0	1, 2 Aug. 1979	(5)
5097	HDFG:	0	14-16 Jan. 1980	(5)

Union Mill

5098	HDFG:	0	1 Aug. 1975	(1)
5099	HDFG:	0	15 Jan. 1976	(2)
5100	HDFG:	0	4, 5 Aug. 1976	(2)
5101	HDFG:	0	13 Jan. 1977	(2)
5102	HDFG:	0	27, 28 July 1977	(2)
5103	HDFG:	0	12, 13 Jan. 1978	(2)
5104	HDFG:	0	15, 16, 20 Jan. 1979	(5)

5105	HDFG:	0	1, 2 Aug. 1979	(5)
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5106	HDFG:	0	14-16 Jan. 1980	(5)
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Upolu - Biogenics Basin

5107	HDFG:	0	1 Aug. 1975	(1)
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5108	HDFG:	0	15 Jan. 1976	(2)
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5109	HDFG:	0	4, 5 Aug. 1976	(2)
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5110	HDFG:	0	13 Jan. 1977	(2)
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5111	HDFG:	0	27, 28 July 1977	(2)
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5112	HDFG:	0	12, 13 Jan. 1978	(2)
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5113	HDFG:	0	15, 16, 20 Jan. 1979	(5)
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5114	HDFG:	0	1, 2 Aug. 1979	(5)
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5115	HDFG:	0	14-16 Jan. 1980	(5)
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KAWAIHAE

Kahua Ranch Reservoir

5116	HDFG:	0	14, 15, 16 Jan. 1980	(5)
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5117	HDFG:	0	31 July, 1 Aug. 1980	(5)
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KUKUIHAELE

Kukuihaele

5118	HDFG:	0	1 Aug. 1975	(1)
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5119	HDFG:	0	15 Jan. 1976	(2)
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5120	HDFG:	0	4, 5 Aug. 1976	(2)
5121	HDFG:	0	13 Jan. 1977	(2)
5122	HDFG:	0	27, 28 July 1977	(2)
5123	HDFG:	0	12, 13 Jan. 1978	(2)
5124	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5125	HDFG:	0	1, 2 Aug. 1979	(5)
5126	HDFG:	0	14-16 Jan. 1980	(5)
5127	HDFG:	0	31 July, 1 Aug. 1980	(5)

Lalakea Reservoir

5128	HDFG:	0	1 Aug. 1975	(1)
5129	HDFG:	0	15 Jan. 1976	(2)
5130	HDFG:	0	4, 5 Aug. 1976	(2)
5131	HDFG:	0	13 Jan. 1977	(2)
5132	HDFG:	0	22-28 July 1977	(2)
5133	HDFG:	0	12, 13 Jan. 1978	(2)
5134	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5135	HDFG:	0	1, 2 Aug. 1979	(5)
5136	HDFG:	0	14-16 Jan. 1980	(5)

Waipio Valley

5137	Banko: Matsunami (resident 19540-1966) stated that a few come every winter when sea is rough and stay briefly in estuary	22 Sep. 1966	(18)
5138	HDFG: 0	1 Aug. 1975	(1)
5139	HDFG: 0	15 Jan. 1976	(2)
5140	HDFG: 0	4, 5 Aug. 1976	(2)
5141	HDFG: 0	13 Jan. 1977	(2)
5142	HDFG: 0	27, 28 July 1977	(2)
5143	HDFG: 0	12, 13 Jan. 1978	(2)
5144	HDFG: 0	15, 16 Jan. 1979	(5)
5145	HDFG: 0	14-16 Jan. 1980	(5)
5146	HDFG: 0	12 Jan. 1981	(5)

Kona District

ANAEHOOMALU

Kahapapa Fishpond (land of Anaehoomalu)

5147	Banko: Baker saw 2	16 Mar. 1972	(18)
5148	Banko: Baker saw 2	17 Mar. 1972	(18)

PUU HINAI

Francis Brown (Waipuhi, Manoku, Hopeaia Fishponds)

5149	HDFG: 0	1 Aug. 1975	(1)
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5150	HDFG:	0	15 Jan. 1976	(2)
5151	HDFG:	0	4, 5 Aug. 1976	(2)
5152	HDFG:	0	13 Jan. 1977	(2)
5153	HDFG:	0	27, 28 July 1977	(2)
5154	HDFG:	0	12, 13 Jan. 1978	(2)
5155	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5156	HDFG:	0	1, 2 Aug. 1979	(5)
5157	HDFG:	0	14-16 Jan. 1980	(5)

MAKALAWENA

Opaeula (Makalawena) Pond

5158	HDFG:	22	Dec. 1962	(1)
5159	HDFG:	8	14-18 Jan. 1963	(1)
5160	23 recently found		3 Sep. 1963	ANON63
5161	HDFG:	13	3 Sep. 1963	(1)
5162	HDFG:	16	14 Jan. 1965	(1)
5163	17 censused		9, 10 Sep. 1965	KRIE65c
5164	HDFG:	14	13, 14 Jan. 1966	(18)
5165	Banko:	15	9 Feb. 1966	(18)
5166	Banko:	24 + 1 nest	5 Apr. 1966	(18)
5167	Banko:	19	17 May 1966	(18)

5168	Banko: 10 counts by HDFG & USFWS range from 8-24 and and average 17 censused	(1963-1966)	(18)
5169	HDFG: 12	13-16 Jan. 1967	(1)
5170	Banko: 10	13 Apr. 1967	(18)
5171	HDFG: 12	8-10 Jan. 1968	(1)
5172	Banko: 17	10 Jan. 1968	(18)
5173	Banko: 23	22 Feb. 1968	(18)
5174	Banko: 14	23 May 1968	(18)
5175	Banko: 11	22-24 July 1968	(18)
5176	HDFG: 11	24 July 1968	(1)
5177	Banko: 9	10 Nov. 1968	(18)
5178	HDFG: 16	24 July 1969	(1)
5179	HDFG: 18	13, 14 Jan. 1969	(1)
5180	HDFG: 12	13-14 Jan. 1970	(1)
5181	Banko: 13	15 Jan. 1970	(23)
5182	Banko: 15	5 Feb. 1970	(18)
5183	Banko: 15	12 Feb. 1970	(23)
5184	Banko: 16	13 Feb. 1970	(18)
5185	Banko: 15	15 Feb. 1970	(18)
5186	Banko: Tomich: 14	5 Apr. 1970	(18)
5187	Banko: 18, night calling heard seaward	19 May 1970	(23)

5188	Banko:	22 plus 2 nests	20 May 1970	(23)
5189	Banko:	17	15 July 1970	(18)
5190	HDFG:	19	7 Aug. 1970	(1)
5191	HDFG:	15	27 July 1971	(1)
5192	HDFG:	14	12 Apr. 1972	(1)
5193	Banko:	16	25 May 1972	(18)
5194	Banko:	16	26 May 1972	(18)
5195	14 censused		27 Feb. 1973	KRIE73a
5196	Banko:	16	9 Mar. 1973	(18)
5197	Banko:	15	11 Mar. 1973	(18)
5198	Banko:	20	15 Mar. 1973	(18)
5199	Banko:	11	5 Apr. 1973	(18)
5200	Banko:	16	31 May 1973	(18)
5201	Banko:	12	1 June 1973	(18)
5202	Banko:	13	8 June 1973	(18)
5203	HDFG:	13	8 Aug. 1973	(1)
5204	HDFG:	18	2 Aug. 1974	(1)
5205	HDFG:	10	1 Aug. 1975	(1)
5206	HDFG:	11	15 Jan. 1976	(2)
5207	HDFG:	10	4, 5 Aug. 1976	(2)

5208	USFWS: 11	1 Dec. 1976	(13)
5209	USFWS: 14, ave. daily use	1 Oct. 1976	(13)
5210	HDFG: 12	13 Jan. 1977	(2)
5211	USFWS: 14, ave. daily use	1 Jan. 1977	(13)
5212	Shallenberger: minimum of 24...possibly more...reported	9 June 1977	(3)
5213	USFWS: 11, ave. daily use	1 Auapr. 1977	(13)
5214	Shallenberger: 3 different age classes of young observed	8 July 1977	(3)
5215	HDFG: 17	27, 28 July 1977	(2)
5216	USFWS: 12, ave. daily use	1 July 1977 - 30 Sep. 1977	(13)
5217	USFWS: 11, ave daily use	1 Oct. 1977 - 31 Dec. 1977	(13)
5218	HDFG: 9	12-13 Jan. 1978	(2)
5219	USFWS: 12 ave. daily use	1 Jan. 1978 - 31 Mar. 1978	(13)
5220	USFWS: 11, ave. daily use	1 Apr. 1978 - 30 June 1978	(13)
5221	HDFG: 16	27, 28, 30 July 1978	(5)
5222	USFWS: 16	19 Sep. 1978	(13)
5223	USFWS: 12, ave. daily use	1 July 1978 - 30 Sep. 1978	(13)
5224	USFWS: 6	Sep. 1978	(13)

5225	USFWS:	11	18 Oct. 1978	(13)
5226	USFWS:	25	24 Nov. 1978	(13)
5227	USFWS:	6	Nov. 1978	(13)
5228	USFWS:	11, ave. daily use	1 Oct. 1978 - 31 Dec. 1978	(13)
5229	USFWS:	25	Nov. 1978	(13)
5230	HDFG:	13	15, 16, 20 Jan. 1979	(5)
5231	USFWS:	15, ave. daily use	1 Jan. 1979 - 31 Mar. 1979	(13)
5232	USFWS:	14	Jan. 1979	(13)
5233	USFWS:	16	Feb. 1979	(13)
5234	USFWS:	8	Mar. 1979	(13)
5235	USFWS:	12	Apr. 1979	(13)
5236	USFWS:	no census	May 1979	(13)
5237	USFWS:	14	June 1979	(13)
5238	USFWS:	no census	July 1979	(13)
5239	HDFG:	13	1, 2 Aug. 1979	(5)
5240	USFWS:	no census	Aug. 1979	(13)
5241	USFWS:	11	Sep. 1979	(13)
5242	USFWS:	13	Oct. 1979	(13)
5243	HDFG:	11	14-16 Jan. 1980	(5)

KIHOLO

Kiholo Fishponds

5244	non seen	9, 10 Sep. 1965	KRIE65c
5245	Banko: Cooper reported seeing 6-8, but only a few times previously	29 Jan. 1970	(18)

KEAHOLE POINT

Aimakapa (Honokohau) Fishpond

5246	Baldwin: 0	23 Nov. 1942	(24)
5247	HDFG: 1	10-13 Jan. 1961	(1)
5248	HDFG: 0	15 Jan. 1962	(12)
5249	HDFG: 3	14 Jan. 1963	(12)
5250	HDFG: 8	15 Jan. 1964	(1)
5251	HDFG: 10	14 Jan. 1965	(1)
5252	20 censused	9, 10 Sep. 1965	KRIE65c
5253	HDFG: 14	1 Jan. 1966	(12)
5254	HDFG: 14	13, 14 Jan. 1966	(1)
5255	Banko: 15	9 Feb. 1966	(18)
5256	Banko: 9	17 May 1966	(18)
5257	HDFG: 9	4 Aug. 1966	(12)
5258	HDFG: 9	11 Aug. 1966	(12)

5259	USFWS: 10 counts by HDFG / USFWS range from 1-20 and and average 10 censused	(1961-1966)	(11)
5260	HDFG: 7	13-16 Jan. 1967	(1)
5261	Banko: 11	15 Jan. 1967	(18)
5262	HDFG: 24	8-10 Jan. 1968	(1)
5263	Banko: 2	10 Jan. 1968	(18)
5264	Banko: 2	21 May 1968	(18)
5265	HDFG: 8	24 July 1968	(1)
5266	Banko: 9	30 Nov. 1968	(18)
5267	HDFG: 0 (blasting nearby)	13 Jan. 1969	(12)
5268	HDFG: 5	24 July 1969	(1)
5269	Banko: 7	5 Sep. 1969	(18)
5270	HDFG: 12	13-15 Jan. 1970	(1)
5271	Banko: 11	13 Feb. 1970	(18)
5272	Banko: 7	20 May 1970	(23)
5273	Banko: 5	15 July 1970	(18)
5274	HDFG: 8	7 Aug. 1970	(1)
5275	HDFG: 10	12 Jan. 1971	(12)
5276	Banko: 4	3 June 1971	(18)
5277	HDFG: 4	24 July 1971	(12)
5278	HDFG: 4	27 July 1971	(1)

5279	HDFG:	14	7 Jan. 1972	(12)
5280	HDFG:	13	8 Jan. 1972	(12)
5281	HDFG:	6	12 Apr. 1972	(1)
5282	Banko:	3	26 May 1972	(18)
5283	6 censused		27 Feb. 1973	KRIE73a
5284	Banko:	9	15 Mar. 1973	(18)
5285	Banko:	6	1 June 1973	(18)
5286	HDFG:	4	8 Aug. 1973	(1)
5287	HDFG:	4	2 Aug. 1974	(1)
5288	HDFG:	7	1 Aug. 1975	(1)
5289	HDFG:	11	15 Jan. 1976	(2)
5290	HDFG:	5	4, 5 Aug. 1976	(2)
5291	USFWS:	8	1 Dec. 1976	(13)
5292	HDFG:	6	13 Jan. 1977	(2)
5293	HDFG:	only 6...disturbance by nude bathers may have contributed to low count	1 July 1976 - 30 June 1977	(2)
5294	HDFG:	9	27, 28 July 1977	(2)
5295	HDFG:	0	12-13 Jan. 1978	(2)
5296	HDFG:	6	27, 28, 30 July 1978	(5)
5297	USFWS:	6	19 Sep. 1978	(13)

5298	USFWS:	6	18 Oct. 1978	(13)
5299	USFWS:	8	24 Nov. 1978	(13)
5300	HDFG:	9	15, 16, 20 Jan. 1979	(5)
5301	USFWS:	6	Jan. 1979	(13)
5302	USFWS:	8	Feb. 1979	(13)
5303	USFWS:	4	Mar. 1979	(13)
5304	USFWS:	5	Apr. 1979	(13)
5305	USFWS:	no census	May 1979	(13)
5306	USFWS:	5	June 1979	(13)
5307	USFWS:	no census	July 1979	(13)
5308	HDFG:	5	1, 2 Aug. 1979	(5)
5309	USFWS:	no census	Aug. 1979	(13)
5310	USFWS:	15	Sep. 1979	(13)
5311	USFWS:	0	Oct. 1979	(13)
5312	USFWS:	no census	Nov. 1979	(13)
5313	USFWS:	no census	Dec. 1979	(13)
5314	HDFG:	14	14-16 Jan. 1980	(5)
Kaloko Fishpond				
5315	HDFG:	0	10 Jan. 1961	(12)
5316	HDFG:	0	19 Jan. 1962	(12)

5317	HDFG:	0	13 Jan. 1963	(12)
5318	HDFG:	0	15 Jan. 1964	(12)
5319	HDFG:	0	14 Jan. 1965	(12)
5320	none seen		9, 10 Feb. 1965	KRIE65c
5321	HDFG:	0	13 Jan. 1966	(12)
5322	HDFG:	0	16 Jan. 1967	(12)
5323	HDFG:	0	8 Jan. 1968	(12)
5324	HDFG:	17 (blasting near Aimakapa drove stilts to Kaloko)	13 Jan. 1969	(12)
5325	HDFG:	3	24 July 1969	(1)
5326	Banko:	0	5 Sep. 1969	(18)
5327	HDFG:	0	15 Jan. 1970	(12)
5328	HDFG:	3	12 Jan. 1971	(12)
5329	HDFG:	0	May 1971	(12)
5330	HDFG:	0	27 July 1971	(12)
5331	HDFG:	2	7 Jan. 1972	(12)
5332	HDFG:	0 (many people around)	8 Jan. 1972	(12)
5333	HDFG:	0	12 Apr. 1972	(1)
5334	HDFG:	0	1 Aug. 1975	(1)
5335	HDFG:	0	15 Jan. 1976	(2)
5336	HDFG:	0	4, 5 Aug. 1976	(2)

5337	HDFG:	0	13 Jan. 1977	(2)
5338	HDFG:	0	27, 28 July 1977	(2)
5339	HDFG:	0	12, 13 Jan. 1978	(2)
5340	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5341	HDFG:	0	1, 2 Aug. 1979	(5)
5342	HDFG:	0	14-16 Jan. 1980	(5)
5343	HDFG:	0	31 July, 1 Aug. 1980	(5)
5344	HDFG:	0	12 Jan. 1981	(5)

KAILUA

Kaupulehu

5345	HDFG:	1	14 Jan. 1965	(1)
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HUALALAI

Huehue Mauka Ponds

5346	HDFG:	0	1 Aug. 1975	(1)
5347	HDFG:	0	15 Jan. 1976	(2)
5348	HDFG:	0	13 Jan. 1977	(2)
5349	HDFG:	0	27, 28 July 1977	(2)
5350	HDFG:	0	12, 13 Jan. 1978	(2)
5351	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5352	HDFG:	0	1, 2 Aug. 1979	(5)

5353	HDFG:	0	14, 16 Jan. 1980	(5)
HONAUNAU				
Napoopoo Pond				
5354	Greenwell:	reported seeing 2	Aug. (?1960)	WALR61
KA LAE				
Kaalualu				
5355	HDFG:	0	1 Aug. 1975	(2)
5356	HDFG:	0	15 Jan. 1976	(2)
5357	HDFG:	0	4, 5 Aug. 1976	(2)
5358	HDFG:	0	13 Jan. 1977	(2)
5359	HDFG:	0	27, 28 July 1977	(2)
5360	HDFG:	0	12, 13 Jan. 1978	(2)
5361	HDFG:	0	27, 28, 30 July 1978	(5)
5362	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5363	HDFG:	0	1, 2 Aug. 1979	(5)
5364	HDFG:	0	14-16 Jan. 1980	(5)
NAALEHU				
Honuapo				
5365	HDFG:	0	1 Aug. 1975	(1)
5366	HDFG:	0	13 Jan. 1977	(2)

5367	HDFG:	0	27, 28 July 1977	(2)
5368	HDFG:	0	12, 13 Jan. 1978	(2)
5369	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5370	HDFG:	0	1, 2 Aug. 1979	(5)
5371	HDFG:	0	14-16 Jan. 1980	(5)
5372	HDFG:	0	12 Jan. 1981	(5)

PUNALUU

Punaluu

5373	HDFG:	2	8-10 Jan. 1968	(1)
5374	HDFG:	0	1 Aug. 1975	(2)
5375	HDFG:	0	15 Jan. 1976	(2)
5376	HDFG:	0	13 Jan. 1977	(2)
5377	HDFG:	0	27, 28 July 1977	(2)
5378	HDFG:	0	12, 13 Jan. 1978	(2)
5379	HDFG:	0	27, 28, 30 July 1978	(5)
5380	HDFG:	0	1, 2 Aug. 1979	(5)
5381	HDFG:	0	14-16 Jan. 1980	(5)

Kiluaea District

KEAAU RANCH

Keaau

5382	HDFG:	0	1 Aug. 1975	(2)
5383	HDFG:	0	15 Jan. 1976	(2)
5384	HDFG:	0	4, 5 Aug. 1976	(2)
5385	HDFG:	0	13 Jan. 1977	(2)
5386	HDFG:	0	27, 28 July 1977	(2)
5387	HDFG:	0	12, 13 Jan. 1978	(2)
5388	HDFG:	0	27, 28, 30 July 1978	(5)
5389	HDFG:	0	15, 16, 20 Jan. 1979	(5)

HILO

Ahn (Kionakapahu Pond)

5390	HDFG:	0	1 Aug. 1975	(1)
5391	HDFG:	0	15 Jan. 1975	(2)
5392	HDFG:	0	4, 5 Aug. 1976	(2)
5393	HDFG:	0	13 Jan. 1977	(2)
5394	HDFG:	0	27, 28 July 1977	(2)
5395	HDFG:	0	12, 13 Jan. 1978	(2)
5396	HDFG:	0	27, 28, 30 July 1978	(5)

5397	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5398	HDFG:	0	1, 2 Aug. 1979	(5)
5399	HDFG:	0	14-16 Jan. 1980	(5)

Nakagawa Lokoaka Pond)

5400	HDFG:	0	1 Aug. 1975	(1)
5401	HDFG:	0	15 Jan. 1975	(2)
5402	HDFG:	0	4, 5 Aug. 1976	(2)
5403	HDFG:	0	13 Jan. 1977	(2)
5404	HDFG:	0	27, 28 July 1977	(2)
5405	HDFG:	0	12, 13 Jan. 1978	(2)
5406	HDFG:	0	27, 28, 30 July 1978	(5)
5407	HDFG:	0	1, 2 Aug. 1979	(5)
5408	HDFG:	0	14-16 Jan. 1980	(5)

Wailoa (Waiakea Pond)

5409	HDFG:	0	1 Aug. 1975	(1)
5410	HDFG:	0	15 Jan. 1975	(2)
5411	HDFG:	0	4, 5 Aug. 1976	(2)
5412	HDFG:	0	13 Jan. 1977	(2)
5413	HDFG:	0	27, 28 July 1977	(2)
5414	HDFG:	0	12, 13 Jan. 1978	(2)

5415	HDFG:	0	27, 28, 30 July 1978	(5)
5416	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5417	HDFG:	0	1, 2 Aug. 1979	(5)
5418	HDFG:	0	14-16 Jan. 1980	(5)

HONOKAA

Honokaa Mill

5419	HDFG:	0	4, 5 Aug. 1976	(2)
5420	HDFG:	0	27, 28 July 1977	(2)

Kukaiau

5421	HDFG:	0	1 Aug. 1975	(1)
5422	HDFG:	0	15 Jan. 1975	(2)
5423	HDFG:	0	4, 5 Aug. 1976	(2)
5424	HDFG:	0	13 Jan. 1977	(2)
5425	HDFG:	0	27, 28 July 1977	(2)
5426	HDFG:	0	12, 13 Jan. 1978	(2)
5427	HDFG:	0	15, 16, 20 Jan. 1979	(5)
5428	HDFG:	0	1, 2 Aug. 1979	(5)
5429	HDFG:	0	14-16 Jan. 1980	(5)

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